F. Seley

CITY OF ASTORIA, OREGON

BUILDING CODE

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Ordinance No. 6385, as Amended by Ordinance
No. 6424

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1925

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Office of the Building Inspector

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Building Code of the City of Astoria

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Building Code of the City of Astoria

PART I

INTRODUCTION

SECTION 1. **To be Known as the "Building Code."** The following provisions shall constitute and be known as the Building Code, and may be cited as such and presumptively provides for all matters concerning, affecting or relating to the construction, equipment, alteration, repair or removal of buildings or any structure whatsoever erected or to be erected in the City of Astoria.

SECTION 2. **Existing Buildings.** Unless existing buildings or structures are specifically mentioned, the provisions of this Code shall apply only to buildings or structures hereafter erected or altered. Building Code a Remedial Ordinance Applying to New Buildings to be Altered or Repaired. This Ordinance is hereby declared to be remedial, and is to be construed liberally to secure the beneficial interests and purposes thereof.

PART II

FIRE LIMITS — PERMITS — DAMAGES —STREET OCCUPANCY — FINAL INSPECTION — DEFINITIONS

SECTION 3. **Fire Limits.** 1. The Inner Fire Limits of the City of Astoria shall embrace the following district, to-wit: Commencing at a point on the south boundary line of the right of way of the Spokane, Portland & Seattle Railroad where said boundary line intersects the center line of 7th Street and running thence easterly along the said boundary line to the center line of 15th Street, thence south along the center line of 15th Street to the center line of Exchange Street, thence west along the center line of Exchange Street to the center line of 14th Street, thence south along the center line of 14th Street to the center line of Franklin Avenue, thence west along the center line of Franklin Avenue to the center line of 10th Street, thence north along the center line of 10th Street to the center line of Exchange Street, thence west along the center line of Exchange Street to the center line of 7th Street, thence north along the center line of 7th Street to the place of beginning.

2. The Outer Fire Limits of the City of Astoria shall embrace the following district except that portion of the district which is included within the Inner Fire Limits as above described, to-wit: Commencing at a point on the south boundary line of the right of way of the Spokane, Portland & Seattle Railroad where said boundary line intersects the center line of 2nd Street, and running thence easterly along the south boundary line of the said S. P. & S. R. R. to the center line of 21st Street, thence south along the center line of 21st Street to the center line of Franklin Avenue, thence west along the center line of Franklin Avenue to the center line of 8th Street, thence north along the center line of 8th Street, to the center line of Exchange Street, thence west along the center line of Exchange Street to the center line of 7th Street, thence north along the center line of 7th Street to the center line of Duane Street, thence west along the center line of Duane Street to the center line of 6th Street, thence north along the center line of 6th Street to the center line of Commercial Street, thence west along the center line of Commercial Street to the center line of 5th Street, thence north along the center line of 5th Street to the center line of Bond Street, thence west along the center line of Bond Street to the center line of 2nd Street, thence north along the center line of 2nd Street to the place of beginning.

THE WATER-FRONT FIRE LIMITS OF THE CITY OF ASTORIA SHALL EMBRACE THE FOLLOWING DISTRICT, TO-WIT:

Commencing at a point on the south boundary line of the right of way of the Spokane, Portland & Seattle Railroad where said boundary line intersects the center of 2nd Street and running thence north along the center of 2nd Street to the pier head line on the south side of the Columbia River as established by the U. S. Engineers, thence easterly along said pierhead line to the center of 21st Street, thence south along the center of 21st Street to the south line of the right of way of the S. P. & S. R. R., thence westerly along the south line of said right of way to the place of beginning.

SECTION 4. **Securing of Permits.** No wall, structure, building, or part thereof, shall hereafter be built or constructed, nor shall the plumbing, drainage, piping, or wiring of any building, structure or premises, be installed or altered, without a permit having first been secured from the Building Inspector, and except in conformity with the provisions of this Code.

SECTION 5. **Plans and Specifications.** Before the erection, construction or alteration of any building or structure, or part of same, and before the installation or alteration of the plumbing, drainage, piping or wiring of any building, structure, or premises is begun, there shall be submitted to the Building Inspector complete duplicate plans and specifications covering material or materials to be used, and containing a detailed statement of the maximum live load for which each floor is designed when floor construction is involved in the proposed work. Plans shall clearly show all parts of the construction including the plan of each floor of a new building. One set of the approved plans and specifications shall be retained by the Building Inspector and one plan shall be kept at the building during its construction. No changes from the approved plans shall be made until revised plans and specifications have been submitted to and approved by the Building Inspector.

SECTION 6. **Application for Permit.** The permit may be applied for and obtained by the owner or lessee direct or acting through an architect, engineer, constractor or other agent.

The application shall state the location giving lot and block number of the proposed building or structure. It shall give the name and residence address of the actual owner or owners of the land and of the building or structure, the name and residence address of lessee or lessees, if any, and the name and address of architect, engineer or designer of the building or structure.

The application shall be made upon blanks furnished by the Building Inspector and shall conform to the requirements as indicated on the blanks so furnished.

SECTION 7. **Life of Permits Limited.** If, after issuance of a permit, the operations authorized thereunder be not commenced within six (6) months after date of permit or if after commencement of operations, the work be discontinued for a period of twelve (12) months, such permit shall be void and work may not be again commenced until a new permit shall have been issued as for original work.

SECTION 8. **Issuance of Permits.** If the application, plans and specifications conform to the requirements of the Code, the Building Inspector shall issue a permit and shall mark the plans and specifications approved, retaining for the office records, one complete set and delivering to the applicant the second set. The approved plans and specifications shall be kept upon the work until all operations under the permit have been completed and accepted.

It shall be unlawful to mark on, alter, change or mutilate approved plans or specifications except as mentioned in Section 3. At the time the permit is issued, the Building Inspector shall deliver to the applicant a card setting forth the number of the permit and in general terms the kind and extent of the work authorized, which card shall be kept conspicuously posted on the premises until the operations are completed and work accepted by the Building Inspector.

Permits requiring the approval of the Bureau of Health, the Bureau of Fire, the Fire Marshal or other authority, shall not be issued until such written approval to the application shall have been first secured.

A permit issued by the Building Department for the construction of a building does not cover any work performed outside of the property lines of the property. Duplicate plans showing proposed method of constructing driveways or of any proposed alterations or construction of any kind within the street or sidewalk area must be presented to the City Engineer and if same are approved by him a permit will be promptly issued covering such work. No work may be begun without this permit from the City Engineer or under special ordinance passed by the City Council.

No fees for permits to tear up streets and sidewalks shall be required, but no such work shall be undertaken without a permit having first been obtained from the City Engineer. The applicant shall pay to the City Engineer a deposit guaranteeing the satisfactory restoration of such streets and sidewalks, as follows:—

For macadam pavement, 20 cents per sq. ft., but the minimum charge shall be $2.

For concrete, brick or asphalt pavement, 50 cents per sq. ft., but the minimum charge shall be $5.

For sidewalks, 25 cents per sq. ft., but the minimum charge will be $2.

Such deposits shall not be required when sidewalks are to be built or rebuilt, but permits for this work must be obtained.

The deposit shall be returned upon the restoration of the street or sidewalk to a condition satisfactory to the City Engineer, but if the holder of the permit refuses or neglects to make such repairs or restoration within five days after being notified to do so by the City Engineer, the City Engineer shall make or cause such repairs to be made and shall pay the cost of same out of the money deposited.

SECTION 9. **Demolition of Buildings.** No building or structure shall be demolished unless a permit shall have first been obtained from the Building Inspector.

The building Inspector shall be given not less than twenty-four (24) hours notice before the demolition of any building or structure is begun.

In demolishing any building or structure or part thereof, story after story shall be completely removed. No material shall be placed upon a floor of any building in the course of demolition; the bricks, timbers and other parts of each story shall be lowered to the ground immediately upon displacement. The material to be removed shall be properly wet to lay the dust incident to its removal.

When any building or structure over 40 feet in height is demolished, a shed covering shall be provided as required by Section 195.

SECTION 10. **Moving Buildings.** No building shall be moved anywhere within the City Limits unless the owner or mover shall have first obtained. from the Building Inspector, a permit therefor. The permit shall state the kind of and the place from and to which the building is to be moved, also a time limit, within which the work shall be done.. Whenever a building shall be moved over or along any public street or alley, the permit to move shall also be signed by the City Engineer, and the owner or mover shall deposit with the City Engineer such an amount as will in the opinion of the City Engineer guarantee the satisfactory repairs of any damage which may be done to such street or alley. This deposif shall be returned whenever such damage has been repaired to the satisfaction of the City Engineer. If, however, the owner or mover shall refuse or neglect to make such repairs within five days after being notified to do so by the City Engineer, the City Engineer, shall make or cause to be made such repairs and shall pay the cost of same out of the money deposited for that purpose.

SECTION 11. **Non-Liability of City For Damages.** Every application for a building permit shall contain an agreement to hold the City and its officials harmless from all costs and damages which may accrue from use or occupancy of the sidewalk, street or sub-sidewalk space.

SECTION 12. **Fees for Permits.** Fees for the issuance of permits for new construction shall be determined as follows:

For each one hundred (100) square feet of floor surface, including all basement and sub-basement floors, except such portions as rest directly upon the ground, and are used only for storage or heating plants, the area to be measured by the outside dimensions of the building as follows:

For Buildings of Class A Construction	25c
For Buildings of Class A-B Construction	22c
For buildings of Class B or Mill Construction	20c
For Buildings of Class C Construction	18c
For Buildings of Class D Construction	15c

It is provided, however, that the permit fee for new dwellings of a permanent, of a temporary, or of a shack type, shall not be less than $1.00.

From the above schedule of fees there is exempted one story frame sheds without a floor or with a plank floor resting directly upon the ground and there is also exempted open timber docks, wharves, or platforms, for all of which buildings the fees for permits shall be at the rate of eight (8) cents per one hundred (100) square feet of ground sheltered or of floor areas or platform area provided by such structure.

The fees for all permits shall be calculated to the nearest fifty (50) cent unit.

The minimum fee for any permit, unless otherwise specified, shall be fifty (50) cents.

(b) Fees for the issuance of permits for alterations, for repairs, for excavation, for demolition, or for any work which cannot be measured in square feet of floor area shall be calculated on the following basis:

For Cost of Building Operation Not Exceeding $25.00	No Charge
For Cost of Building Operation Not Exceeding $500.00	50c
For Cost of Building Operation $500.00 or more, but Not Exceeding $1000.00	$1.00

For Cost of Building Operation Exceeding $1000.00, the Fees Shall be Charged at the Rate of 50c for each $1000.00 or part thereof.

(c) If any work upon the excavation, construction, alteration, repair, removal or demolition of any building is commenced without permit, the fee assessed when permit is issued shall be doubled that hereinbefore stated. Payment of such fee, or double fees, shall in no ways relieve the person undertaking the unauthorized work of the penalties imposed by this Code.

(d) No fees shall be exacted for work undertaken by the City of Astoria, by the County of Clatsop, or by the School Board, if such work be done by its own employees.

(e) No fees shall be charged for the installation of heating apparatus if the same be included in the regular building permit. Under other conditions, the installation of heating apparatus shall be covered by permit for which the fees specified in this Section shall be paid.

SECTION 13. **Temporary Occupancy of a Public Street.** The permit for the erection of any building shall include permission to occupy, not to exceed 1-3 of the width of the roadway of the street or streets, adjacent to such buildings; and not more than ½ of the width of the sidewalk, pertaining to such buildings, in existence at the time of construction; provided that in the case of building over two (2) stories in height the free passage way of the sidewalk shall be covered by a susbtantial roof or shed.

SECTION 14. **Certificate of Final Inspection With Permission to Occupy.** Every building shall be inspected before occupancy. Notice that the building is ready for final inspection shall be served upon the Building Inspector by the owner or his agent and if such building, upon inspection, be found to conform to the Code, a certificate of final inspection shall be issued to the owner. In exceptional cases, the Building Inspector may issue a temporary certificate, permitting the occupancy of a completed portion of an unfinished building when no danger to the occupants of the public may result therefrom.

Upon completion of such building, structure or alteration provided no violations of this Code exists, the Superintendent shall issue to the owner a Certificate of Occupancy of the proposed building or part thereof, stating the purposes for which the building or structure may be used; also the maximum live load, and maximum number of persons that may be accommodated on each floor thereof.

No building, structure or part thereof shall be altered or converted in a manner to affect its occupancy, or used for any purposes whatsoever until the issuance of a Certificate of Occupancy; nor shall any building, structure or part thereof be occupied or used for any other purpose, or in any manner other than that prescribed in said certificate of occupancy; nor shall any building or structure or part thereof be burdened by any greater load, or be occupied by a greater number of persons than designated in said certificate.

SECTION 15. **Definitions.** The following terms when used in this Code shall be construed to have the meaning here given them.

Words used in the present tense include the future as well as the present; the singular number includes the plural and the plural the singular; the "person" includes a corporation or co-partnership as well as an individual; "writing" includes printing, printed, or typewritten matter.

(a) When reference is made to "National Code" it shall mean the Building Code recommended by the National Board of Fire Underwriters.

(b) The term Building Inspector shall include Plumbing and Electrical Inspector.

1. **Apartment House.** Same as tenement house.

2. **Approved.** The term "approved" refers to a device, material or construction which has been approved by the Underwriters' Laboratories; or such approval may be granted by the Superintendent of Building Construction as a result of tests or investigation made under his discretion; or he may issue approval upon satisfactory evidence of competent and impartial tests or investigations conducted by others.

3. **Approved Fire-Resistive Roofing.** Roofing which shall at least meet the requirements of the test specified in Section 174, paragraph 8, National Code.

4. **Areaway.** An open sub-surface space adjacent to a building for lighting or ventilating cellars or basements.

5. **Area of a Building.** The area of the horizontal cross-section at the ground level measured to the center of party walls or fire walls, and to the outside of other walls.

6. **Basement.** A story partly but not more than one-half below the level of the curb.

7. **Bearing Wall.** A wall which supports any load other than its own weight.

8. **Bulkhead or Pent House.** A structure erected on the roof of a building for the purpose of enclosing stairways to the roof, elevator machinery, water tanks, ventilating apparatus, exhaust chambers or other building equipment machinery and for janitor's quarters. When used only for the above mentioned purposes, such structures need not be considered in determining the height of the building.

9. **Cellar.** A story whose height is more than one-half below the level of the curb. It shall not be counted as a story in determining the height of a building.

10. **Cement Mortar.** See section 45.

11. **Cement Plaster.** A plaster composed of one part Portland cement, not more than three parts sand and not more than 10 per cent by volume of hydrated lime, with hair or other binder when necessary.

12. **Cement-tempered Plaster.** A lime or gypsum plaster tempered with not less than 20 per cent of Portland cement.

13. **Court.** See Tenement House Law, Section 270, National Code.

14. **Curb.** Wherever the word "curb" refers to the height of a building or to the definition of a basement or cellar, it shall be construed to mean the curb level or established grade at the center of the principal front of the building fronting on two or more streets, the curb level at the center of the front facing on the highest curb shall be taken, unless the highest curb is more than 10 feet higher than the lowest curb, in which case the average level of the two curbs shall be taken. Whenever the word "curb" refers to an excavation, the level of the curb shall

be taken at the intersection of the lot lines and curb lines. In the case of a building fronting on two or more streets, the curb levels shall be taken on each street at the intersection of the lot lines and the curb lines, and their relation to an adjoining building or buildings be as though two or more excavations were to be made.

15. **Curtain Wall.** Any exterior non-bearing wall between columns or piers, which is not supported by beams or girders at each story. See Section 86.

16. **Dead Load.** The weight of the walls, framing, floors, roofs, tanks with their contents, and all permanent construction.

17. **Department.** The Department of Buildings.

18. **Division Wall.** Any interior wall in a building.

19. **Dwelling.** A residence building, designed for, or used as, the home or residence of not more than two separate and distinct families.

20. **Enclosure Wall.** See panel wall.

21. **Existing Building.** A completed building or structure, or one for which plans have been filed previous to the date on which this Code goes into effect.

22. **Exterior Wall.** Any outside wall, or vertical enclosure of a building, other than a party wall.

23. **Factory.** A building or portion thereof, designed or used to manufacture or assemble goods wares, or merchandise, the work being performed wholly, or principally by machinery.

24. **Fibre Plaster Board.** A board consisting of an intimate mixture of gypsum plaster composition and a fibrous binding material.

25. **Fire Door.** A door, frame, and sill which will successfully resist a fire for one hour in accordance with test specifications given in Section 174, National Code, and has been approved upon such test. For self-closing and automatic fire doors, see Section 88, paragraph 4.

26. **Fire Exit Partition.** A sub-dividing partition built for the purpose of protecting life by providing an area of refuge. See Section 98.

27. **Fireproof.** As used in this Code, except as elsewhere prescribed by test for particular types of construction, refers to ordinary fires, and which will withstand such fires without serious impairment of their usefulness for at least one hour.

28. **Fireproof Construction.** See Sections 113 to 176.

29. **Fire Shutter.** A shutter which will successfully resist a fire for one hour in accordance with test specifications given in Section 174, National Code, and has been approved upon such test.

30. **Fire Wall.** A wall built for the purpose of restricting the area subject to the spread of fire. See Section 88.

31. **Fire Window.** A window frame, sash, and glazing which will successfully resist a fire for one hour in accordance with test specifications given in Section 174, National Code, and has been approved upon such test. No single pane in a fire window shall exceed 720 square inches.

32. **Foundation Wall.** Any wall or pier built below the curb level or nearest tier of beams to that level.

33. **Garage.** A garage is (a), that portion of a structure in which a motor vehicle containing volatile inflammable oil in its fuel storage tank is stored, housed or kept; (b), all that portion of such structure that is on, above, or below the space mentioned in (a), which is not separated therefrom by tight, unpierced fire-walls and fireproof floors.

34. **Gypsum Block.** The term "gypsum block" shall include tile or blocks composed of gypsum and not to exceed 5 per cent by weight of combustible fibre binding material; or a mixture of crushed cinders and gypsum, commonly called "cinder-plaster blocks."

35. **Gypsum Mortar or Plaster.** See Section 45.

36. **Height of a Building.** The vetrical distance from the curb level to the top of the highest point of the roof beams in the case of flat roofs, or to the average height of the gable in the case of roofs having a pitch of more than 20 degrees with a horizontal plane. When a building faces two or more streets having different grades, the measurement shall be taken at the middle of a facade on the street, having the greatest grade. When a building does not adjoin the street, the measurement shall be taken from the average level of the ground adjoining such buildings. In measuring the height of a wall, the height of the parapet above the top of the roof beams shall not be included. See Section 61, paragraph 3.

37. **Horizontal Exit.** See Section 97, paragraph 2 (C).

Section 15

38. **Hotel.** Any building or portion thereof, designed or used for supplying food or shelter to residents or guests, and containing more than fifteen sleeping rooms above the first story.

39. **Incombustible.** Materials or construction which will not ignite and burn when subjected to fire.

40. **Length of Building.** Its greatest horizontal dimension.

41. **Live Load.** All loads other than dead loads. All partitions which are subject to removal or rearrangement shall be considered as live load.

42. **Mill Construction.** See Sectioin 19, also Part XX.

43. **Non-bearing Wall.** One which supports no load other than its own weight.

44. **Non-Fireproof Construction.** See Section 20.

45. **Occupied.** Shall be construed to mean occupied, to be occupied, or intended or designed to be occupied.

46. **Office Building.** One used for professional or clerical purposes, but not for manufacturing, storage, or sale of goods except by sample; also excepting the first story which may be used for commercial purposes. No part of such building shall be used for living purposes except by the janitor's family.

47. **Ordinary Construction.** A building having masonry walls, with floors and partitions of wooden joist and stud construction. The supporting posts and girders may be of wood or of metal protected as required in A and A-B buildings.

48. **Outhouses.** All structures not exceeding 8 feet in height, nor more than 150 square feet in area, exclusive of sheds.

49. **Owner.** Any person, firm or corporation owning or controlling property, and includes a duly authorized agent or attorney. Guardians, conservators or trustees shall also be regarded as owner.

50. **Panel or Enclosure Wall.** An exterior non-bearing wall in a skeleton structure built between columns or piers and supported at each story. See Section 86.

51. **Parapet Wall.** That portion of any wall which extends above the roof line and bears no load except as it may serve to support a tank. See Section 89.

52. **Party Wall.** A wall used or adapted for joint service between two buildings.

53. **Public Building.** See Section 32, paragraph 2.

54. **Public Hallway.** A hall, corridor or passageway used in common by the occupants of a building and serving as a means of communication for the public between an entrance to any store of a building, and the various rooms, apartments or spaces in that story.

55. **Retaining Wall.** One constructed to support a body of earth or to resist lateral thrust.

56. **Shed.** A roofed structure, open on one or more sides, which does not exceed 15 feet in height nor more than 500 square feet in area.

57. **Skeleton Constuction.** A form of building construction wherein all external and internal loads and stresses are transmitted to the foundations by a rigidly connected framework or metal or reinforced concrete. The enclosing walls are supported by girders at each story.

58. **Skylight.** Any cover or enclosure placed above roof openings for the admission of light.

59. **Slow-burning Construction.** See Section 19, also Part XX.

60. **Smokeproof Tower.** See Section 96, (b).

61. **Story.** That part of any building comprised between any floor and the floor or roof next above. In case any floor or the combined area of floors at any one level extends over less than 20 per cent of the horizontal area including within the outside walls at that level, the same shall not be considered as a floor for the purpose of determining story height.

62. **Structure.** Includes the terms building, appurtenance, wall, platform, staging, or flooring used for standing or seating purposes; a shed, fence, sign, or billboard on public or private property, or on, above or below a public highway.

63. **Superintendent.** The Superintendent of Building Construction, or such other official title as a city charter may apply to that office or position, which has assigned to it such duties as are generally recognized in supervising building construction. It shall also include any deputy or assistant authorized to represent such public official.

64. **Tenement House.** See Tenement House Law, Section 269, National Code.

65. **Theatre.** Any building or part of a building designed or used for theatrical or operatic purposes with accommodation for an audience of more than

three hundred persons, and having a permanent stage upon which movable scenery and theatrical appliances are employed; including also moving picture theatres, either with or without a stage and having capacity as above stated. See also Sections 180 to 183.

66. **Warehouse.** A building or portion thereof, designed or used for the storage of merchandise.

67. **Width of a Building.** The horizontal dimension next in value to the length.

68. **Workshop.** A building or room in which articles of merchandise are manufactured or repaired wholly or principally by hand.

69. **Wired Glass.** Glass not less than ¼ inch thick enclosing a layer of wire fabric reinforcement having a mesh not larger than ⅞ inch, and the size of wire not smaller than No. 24. B.

70. **Yard.** See Tenement House Law, Section 278 National Code.

PART III

CLASSIFICATION

SECTION 16. **Classification of Buildings According to Construction.** For the purpose of this Code, buildings are classified according to construction as follows:

Class A, Class A-B. Class Mill, Class B, Class C, Class D.

SECTION 17. **Class A.** Class "A" buildings are defined as those having fireproof frames of steel and with all structural parts of incombustible material. Walls shall be of brick, stone, concrete or reinforced concrete.

Class "A" buildings with all wall loads above the third floor carried on the steel frame shall not be limited as to height.

Class "A" buildings with self-supporting curtain or bearing walls on the exterior shall be limited in height to 86 feet.

Class "A" buildings may be built anywhere in the city.

SECTION 18. **Class A-B.** Class "A-B" buildings are defined as those having a frame of reinforced concrete carrying all wall and floor loads. All structural parts shall be of incombustible material. Walls shall be of brick, stone or reinforced concrete. The maximum limit of height of Class "A-B" buildings shall be ten (10) stories and they may be built anywhere in the City.

For detailed specifications for A and A-B buildings see Section 113 to 163.

SECTION 19. **Class Mill "Slow Burning."** A building having masonry walls and heavy timber interior construction.

Buildings of this class not higher than six stories or 84 feet may be built anywhere in the City.

For detailed specifications see National Code Pamphlet.

SECTION 20. **Class B.** Buildings having outer walls of brick, stone, concrete, concrete tile, hollow clay tile, or reinforced concrete; combustible material may be used in all parts except walls. Compostion, metal, slate, or tile roof; walls rising above roof at least 12 inches and properly coped, all basement floors, when laid, shall be composed of incombustible material.

Buildings having outer walls of concrete tile shall be not over two stories in height, and the thickness of walls shall be no less than twelve inches for the first story and not less than eight inches for the second story.

Buildings having outer walls for hollow clay tile shall be not over one story in height, and the thickness of the walls shall be not less than 12 inches.

In Class B Buildings exterior walls of hard burned hollow clay tile not less than 8 inches in thickness, if laid in Portland cement mortar containing not more than 10 per cent of lime, will be permitted for non-bearing exterior walls or for enclosing curtain walls only and provided the vertical span does not exceed 17 feet or the horizontal span does not exceed 23 feet.

Buildings of this class not higher than four (4) stories or 55 feet may be built anywhere in the City; except that within the inner fire limits:

In all buildings of this class consisting of one (1) story and basement the interior may be of ordinary timber construction.

In all buildings of this class consisting of two (2) stories and basement the first floor shall be of standard Mill construction, but balance of building may be of ordinary timber construction.

Section 21

In all buildings of this class not over two stories in height and without basement, all interior work may be of ordinary timber construction.

In all Class B Buildings consisting of over one (1) story, or of one (1) story and basement, all partitions between occupancies shall be constructed wholly of incombustible material, or by 2 x 4 wooden studding with metal lath and ¾ inch of cement or cement tempered plaster on each side, except such partitions as are referred to in Section 112. (Relating to Boiler and Furnace Rooms). Wooden studs shall be set with the 4 inch dimension at right angles to the wall. All such partitions shall be fire-stopped the full depth of the floor beams at each floor level in the manner specified in Section 73. Openings in such partitions shall be protected by fire doors and windows as specified in Section 67.

Stairway enclosures shall be of the same construction as specified for partitions between separate occupancies, and except at the street entrance to a stairway, there shall be an automatic or self-closing fire door at the bottom of each flight.

Soffits of all stairways extending beyond the limits of the enclosures of the fire resisting partitions shall have the soffit and other exposed surfaces of incombustible material or Standard Mill Construction.

In buildings of one story and basement stairways may be enclosed with double 1 inch matched lumber, with selfclosing door of the same material.

SECTION 21. **Timber Columns, Posts and Trusses.**

1. All timber columns and posts shall be squared at the ends perpendicular to their axes, and iron or steel cap plates and base plates shall be provided.

2. Where the cap plate of a timber column or post supports a wooden girder any column above shall bear directly on the metal cap and shall not rest on the girder. Steel check plates shall be bolted to the girders and posts, when required for safety.

3. All bolts used in connection with timber work shall be provided with washers of such proportions as will reduce the compression on the wood at the face of the washer to that allowed in Section 47, paragraph 4, supposing the bolt to be stressed to its limit.

Timber column stresses, Section 47, par. 4, and Section 48 par. 4.

SECTION 22. **Class C.** A masonry building not up to the standard of Class B, or having hollow cement blocks or hollow tile walls, shingle roof, or side walls not rising above roof and having interior of ordinary timber construction.

Buildings of this Class not higher than four (4) stories or 55 feet may be built anywhere in the City except within the inner Fire Limits; provided that if such buildings be erected within the outer Fire Limits, the construction as to roofs and parapet walls must conform to the requirements of Class B buildings.

SECTION 23. **Ordinary Timber Construction.** 1. Every wooden beam in any part of fire wall shall be separated from any other beam in the wall by at least 6 inches of solid masonry. Such separation may be obtained by staggering the beams, corbeling, or by use of approved steel hangers properly anchored in the wall, and arranged to make the beams self-releasing. No wall shall be corbeled more than 2 inches for this purpose. If the beam ends are opposite each other in the wall the separation shall be not less than 8 inches. Fig. 17 page 97 in National Code indicates spacing and arrangement of beams of different thickness in a 12-inch wall which will meet the requirement of this Section. The spacing could be reduced if the walls under the beams were corbeled.

2. No wooden floor or roof beam used in any building within the fire limits shall be less than 2 inches thick.

3. The thickness of wooden beams shall be not less than 3 inches in any building where the floor load is greater than 60 pounds per square foot.

4. Trimmer and header beams, over 4 feet in length shall be hung in approved metal stirrups or hangers.

5. Every wooden beam, except header and tail beams, shall have bearings of at least 4 inches.

6. The ends of all wooden floor and roof beams, which rest on walls, shall be cut to a bevel of 3 inches in their depth.

7. Neither end of a floor or roof beam shall be supported on stud partitions, except in frame buildings.

8. All wooden floor and roof beams shall be

properly braced with cross bridging. The distance between bridging or between bridging and bearing shall not exceed 8 feet. So far as possible knots or other imperfections shall be excluded from the bottom and top quarters of timber beams.

SECTION 24. **Wooden Beams Separated from Masonry Chimneys.**

1. No wooden beams or joists shall be placed within 2 inches of the outside face of a chimney or flue, whether the same be for smoke, air or any other purpose.

2. No woodwork shall be within 4 inches of the back face of the wall of any fireplace, unless same is backplastered and the woodwork is covered with sheet asbestos or sheet metal, in which case the distance may be reduced to 1 inch.

3. For smoke flues of boilers and furnaces where the brick work is required to be more than 8 inches in thickness, the header beams shall be not less than 4 inches from the outside of the brick work.

4. All spaces between the chimney and the wooden beams shall be filled with mineral wool, loose cinders, gypsum block, or other porous incombustible material.

5. The header beam, carrying the tail beams of a floor, and supporting the trimmer arch in front of a fireplace, shall be not less than 20 inches from the chimney breast.

6. No wooden furring or studding shall be placed against any chimney; the plastering shall be directly on the masonry, or on metal lathing.

SECTION 25. **Anchors for Wooden Beams and Girders.**

1. Each tier of beams shall be anchored to the walls with steel anchors at intervals of not more than 6 feet in each direction and where joist run parrallel with the wall, shall cross at least four beams.

2. Where the beams are supported by girders, the girders shall be fastened to each other by steel straps and shall be supported at wall or piers by the use of steel or cast iron self-releasing supports.

3. The ends of wood beams resting upon girders shall be abutted together, end to end, or lapped, spiked, and strapped by steel straps of the same size

and distance apart, and in the same manner as the wall anchors.

SECTION 26. **Class D. Frame Construction.** A building having the exterior walls or portions thereof of wood; also a building with wooden framework veneered with brick, stone, terra cotta, or concrete; or covered with plaster, stucco, or sheet metal, shall be classed as a frame building.

Buildings of this class may be erected anywhere within the City except within the outer or inner or waterfront Fire Limits, except as hereinafter specified.

Permissilbe Wooden Buildings or Structures Within Fire Limits. No frame building or structure shall be erected within the fire limits except the following; and all roofs placed upon such buildings or structures shall have approved covering;

(a) Temporary one story frame buildings for use of builders, and temporary stands, platforms, booths and tents, for which permits shall be obtained from the Building Inspector. Such frame structures for use of builders in connection with the erection of a new building shall be moved as soon as the building is completed; other temporary frame structures shall be removed as soon as they have ceased to serve the original purpose for which they were permitted.

(b) One story sheds open on the long side, not over 15 feet high, with sides covered with incombustible material, and with an area not exceeding 500 square feet. A wooden fence shall not be used to form the back or side of such sheds.

(c) Wooden fences not over 10 feet high.

(d) Piazzas or balconies not exceeding 10 feet in width, nor extending more than three feet above the second-story beams. No such structure shall extend beyond the lot line, or be joined to any similar structure or another building.

(e) Bay windows when covered with incombustible material, and as limited by Section 78, paragraph 4.

(f) Small outhouses not exceeding 150 square feet in area and 8 feet high.

(g) Ice houses not exceeding 15 feet in height nor more than 300 square feet in area. Wooden sheds, ice houses, or outhouses shall not be located within 5 feet of any lot line, nor less than 30 feet from any other building over one story high.

(h) Signs as provided by Section 9.

Section 26

PERMISSIBLE BUILDINGS WITHIN THE WATER FRONT FIRE LIMITS

(1)

Hereafter no buildings shall be erected, altered or added to within this area excepting that it be built in accordance with the requirements elsewhere set forth in this code for buildings of Class A, Class A-B, Class B, Class C or as follows:

(2) FLOOR AND ROOF LOADS

In designing buildings within the Water Front Area, allowances shall be made to safely carry such live loads as are required for warehouses or other buildings designated in Section **36 and 37** of this code, in addition to the dead loads of the structure.

(3) FLOOR DESIGN

The construction of floors may be of ordinary joist construction when such joists are supported on girders at both ends.

(4) INTERIOR PARTITION WALLS

Interior studding partition walls will not be permitted as supporting walls for floors or roofs above the ground floor or wharf level. Where interior posts and girders are provided for the bearing or support of loads above, studded partitions may be used as dividing partitions.

(5) EXTERIOR WALL FRAMEWORK

All exterior walls in buildings of the Water Front Class, if built of timber are to have posts and girders designed to carry all superimposed floors and roofs and shall be so designed with the use of post caps, bases or bearing plates as will allow superimposed posts and girders to fall free from bearings in case of fire, without dislocating other members at bearing points. Nail girts studding or other light frame work may be used only for supporting curtains in the panels if so designed that such light frame work is used only for supporting enclosing wall or wall covering. No supporting post, column, or girder shall (if built of wood) have a cross sectional area of less than 64 square inches.

(6) INTERIOR SUPPORTING FRAME WORK

All interior supports for floors and roofs above the ground floor or wharf level, shall be heavy posts and girders and if built of wood they shall have a cross sectional area of not less than 64 square inches and have bearing connections designed as mentioned for such connections in exterior walls.

SECTION 26 - (i) One story buildings not over 15 feet high with outside covered with plaster or stucco, reinforced or applied on metal lath, and inside covered with plaster board or metal lath with not less than 3/4 inch cement plaster, windows to be steel sash with wired glass. Said buildings to be not less than 10 feet from the side or rear lot lines or from any other building.

(7) EXTERIOR WALL COVERING

Exterior walls shall be covered with galvanized sheet metal of not less than 26 guage if corrugated and not less than 12 guage if not corrugated, or otherwise designed to resist a 20-pound load per square foot for an unsupported length of 3 feet, or covered with a metal fabric and covered, cement mortar or lime tempered cement plaster, asbestos board or other fire resisting material acceptable to the Building Inspector, but must be of such a nature that it will safely sustain a load of 20 pounds per square foot for an unsupported span of not less than 3 feet.

(8) ROOFS

All roofs of buildings in this class shall be equal to or better than roofs allowed on buildings of Class B.

(9) SKYLIGHTS AND MONITORS

Skylights and monitors shall have exterior walls and roof equal to or better than that specified for the exterior walls and roofs of the building.

(10) EXTERIOR DOORS

Exterior doors shall be not less than two thicknesses of one inch T. & G. material covered outside with galvanized iron, not less than 26 guage.

(11) ELECTRICAL WIRING

All buildings of this class shall have electric power and lighting wiring run in approved metal condu't as required for buildings in Class B.

(12) SUPPORTING MEMBERS

All builidngs of this type shall have posts, columns, or other supporting members, if built on pile structures, extend down to and bear on caps or girders which support the deck or wharf portion of the structure. Such posts, columns or other supports will not be allowed to rest on the surface of the decking or floor of the wharf but must be so designed that the collapse of the deck structure would not dislocate or impair the supports of the superstructure.

(13) BOILER ROOMS

No room for the purpose of housing, heating, or power boilers, gas or electric furnaces, or to be used for the production of heat or power shall be built unless it meets with the requirements under Section **112** for furnace rooms.

(14) CHIMNEYS

All chimneys, smoke flues, etc., shall meet the requirements as set forth in Sections **104 to 111**.

SECTION 27. **Frame Buildings Outside of Fire Limits.**

1. No frame building shall exceed two stories or 30 feet in height, except that dwellings occupied by not more than two families may have two and one-half stories, provided they do not exceed 30 feet in height or 3000 square feet in area. The attic in a two and one-half story house may be used for sleeping rooms, but not for living purposes. No family shall be domiciled above the second story. Dwellings occupied by not more than one family may be three stories or 35 feet high. Towers, turrets or minarets on such buildings may exceed the foregoing limit 10 feet, provided the greatest horizontal dimension of such structures does not exceed 15 feet; except also that a church spire may be constructed of wood to a height not exceeding 75 feet from the ground, but such spires shall not be placed nearer any other building or structure than the equivalent of its height measured from its masonry support to the pinnacle.

2. All frame buildings or structures, shall have approved roof coverings.

3. No frame building erected for any occupancy other than buildings of Class F, shall cover a ground area exceeding 5000 square feet, except as restricted in paragraph 4; except also that a frame building equipped with an approved system of automatic sprinklers, may have an increase in area of 66 2-3 per cent, or 8333 square feet.

4. Frame buildings of Class F, and frame buildings of other classes having an area exceeding 5000 square feet without sprinklers shall not be placed within 35 feet of any side or rear lot line; and if the area exceeds 7500 square feet, the distance from a side or rear lot line shall be not less than 100 feet.

5. The combined area of frame buildings, sheds and outhouses located on any lot shall not exceel 80 per cent of the lot area.

6. In no case shall a frame building with wooden siding be erected or altered, to extend within 5 feet of the side or rear lot line nor within 10 feet of another building, unless the space between the studs on such side be filled solidly with no less than 2½ inches of brickwork or other equivalent incombustible material, and the entire exposed side be covered with at least a ⅛ inch layer of asbestos board, or ⅜ inch of plaster board back of the wooden siding.

When such walls are thus filled and covered, their distance from side or rear lot line may be reduced to 3 feet; or to 5 feet from another building. If the adjacent walls of two buildings have no openings, and are filled and covered as above specified, there need be no limitation as to distance between them.

7. Floor beams and rafters in frame buildings shall be not less than 2 inches in thickness. All frame or wood buildings exceeding 15 feet in height shall have their sills secured to the foundations in an approved manner and be erected with sills, posts, girts and plates of suitable size and materials with proper mortise and tenon framing and braced with studs at all angles, but this shall not prohibit the use of balloon framing with proper sills and plate where diagonal sheathing is used, and provided that the outside walls are fire stopped at each floor-level as required in Section 29, paragraph 5.

SECTION 28. **Foundations for Frame Buildings.**

1. The foundation walls of frame buildings or structures exceeding 15 feet in height shall rest on footings of stone or concrete not less than 6 inches in thickness. All footings shall extend at least 4½ inches outward from each side of the bottom of the foundation walls which rest upon them.

2. The bottom of footings for frame buildings shall rest upon solid ground at a depth at least equal to the frost line below the surface unless solid rock occurs above this point; or upon piles or ranging timbers of wood where necessary. The foundation walls of frame structures exceeding 15 feet in height, if of stone, shall be not less than 16 inches thick, and if of brick or concrete, not less than 12 inches thick to the first tier of beams and 8 inches thick from the first to the second tier of beams, or if these walls are constructed of stone, they shall be not less than 18 inches for the foundation walls and 16 inches for the first story wall.

3. Foundation of walls of hollow building blocks shall be not less than 12 inches thick in any part, and shall be constructed as specified in Section 41, paragraph 4.

4. For one story structures not used for dwellings, the thickness and depth of the foundation walls may be modified at the discretion of the Building Inspector.

5. Footings and foundation walls shall be laid in cement mortar.

SECTION 29. **Walls and Partitions in Frame Buildings.**

1. In rows of frame houses, the dividing walls or partitions between houses shall be built of brick, terra cotta, concrete, or other approved incombustible material; or they may be built with 4 inch studs, filled solidly with brickwork laid in mortar, or with other incombustible material and covered on each side with at least ½ inch metal lath and plaster, or plasterboard. Such dividing partitions shall rest on masonry walls or wooden girders and shall extend to under side of roof boards, and a flush mortar joint shall be made between the roof boards and the wall or partition. In rows of more than three houses, every alternate division wall or partition shall be constructed of brick or concrete not less than 8 inches thick. These walls shall extend from front to rear, be solid without openings, and shall extend at least 2 feet above the roof, and be coped. If such parapet be of concrete, or if the top six courses of brick be laid in Portland cement the coping may be omitted.

2. The end of floor beams entering such walls from opposite sides shall be so staggered or separated that there shall be not less than 4 inches of masonry between the beams where they rest on the walls.

3. Timber posts and girders or other approved supports may be used instead of brick fore and aft partitions, in cellars of frame buildings.

4. All stairway and other interior shafts in frame buildings which are required to be enclosed, including dumbwaiter shafts, may be constructed of wood, but they shall be covered with metal lath, or fibre plasterboard at least ½ inch thick, and plastered to a total thickness of ¾ inch; or the plasterboard may be covered with sheet metal. Doors opening into such shafts shall be incumbustible.

5. In all frame buildings which are to be lathed and plastered or otherwise sheathed on the inside, all stud walls and all partitions which rest directly over each other, shall be completely fire-stopped with brick work or other suitable incombustible material at each floor level. The spaces between the ends of floor joists which rest upon masonry foundation walls or upon wall girts, shall be filled solidly with fire-stopping material to the full depth of the joists, and the spaces between the studs shall be filled in the same manner to a height of 6 inches above the first floor level. Partitions which rest over each

other shall be fire-stopped as required in Section 73, paragraph 3. The fire-stopping shall be arranged to cut off all concealed draft openings, and form an effectual horizontal fire barrier between stories.

6. All supporting walls and partitions shall have solid or block bridging between and to the full depth of the foor beams.

SECTION 30. **Cellar Ceiling in Frame Buildings.**

The ceiling over the cellar or lowest floor in every frame building more than one story in height, except dwellings, shall be covered with metal lath and at least a $\frac{3}{4}$ inch coat of cement or cement-tempered plaster; or by a $\frac{3}{8}$ inch layer of plaster board covered with a $\frac{1}{4}$ inch coat of plaster or with a layer of sheet metal.

SECTION 31. **Chimneys.**

All chimneys in frame buildings shall conform to the requirements for chimneys in Section 104.

SECTION 32. **Classification of Buildings by Occupancy.**

1. All buildings shall be classified according to their occupancy or use under one of the three following groups: Public Buildings, Residence Buildings, and Business Buildings. These groups shall be further sub-divided into six classes, two in each group, designated as A, B, C, D, E, and F as follows:

I. Public Buildings:
    Class A
    Class B.
II. Residence Buildings:
    Class C
    Class D
III. Business Buildings:
    Class E
    Class F

2. **Public Buildings.** Public buildings shall be construed to include all buildings or structures accessible to the public, and in which people may congregate for civic, political, educational, religious, amusement or transportation purposes; or in which they may be voluntarily or forcibly detained or housed for safety, punishment, observation, or care.

Class A. Armories, Asylums, Bath Houses (with sleeping accommodations, other than those required by the janitor), City Halls, Colleges, Court Houses, Detention Buildings, Police Stations, Hospitals, Libraries, Museums, Nurseries, Railway Passenger Stations, Schools and Theatres.

Buildings of this class shall be of Class B contruction.

Where armories, railway passenger stations, museums, and similar buildings have large arched exposed roof construction, the fire-proofing of the structural members of these roofs may be omitted if, in the opinion of the Superintendent, the construction of the remainder of the building would reasonably warrant such omission.

Class B. Amusement Halls, Churches, Exhibition Buildings, Lodge Rooms, and Public Halls.

All buildings of this class over two stories in height, shall have the floor over cellar or basement which is nearest to grade level of fireproof construction.

Buildings of this class over four stories, or 55 feet high, shall be of fireproof construction throughout, except that church spires need not be fireproof until they exceed 75 feet in height.

(Restrictions on wooden spires Sec. 27.)

Every permanent structure intended for the seating or accommodation of the public, commonly known as grand-stands, erected within the fire limits, shall be of fireproof construction, except that the seats may be of wood, and the structural steel work may be unprotected. When portions of such structures are enclosed, the enclosing construction shall be fireproof.

3. Residence Buildings. When Required Fireproof. Residence buildings shall be construed to mean and include all buildings in which sleeping accommodations (other than for the janitor or watchman) are provided.

Class C. Bachelor Apartments, Club Houses, and Studios with more than 15 sleeping rooms, Dormitories, Hotels, and Lodging Houses.

Buildings of this class when permitted of frame constructioin shall not exceed two stories or 30 feet in height.

All buildings of this class three stories in height, shall have the floor over cellar or basement which is nearest to grade level of fireproof construction.

Buildings of this class over four stories or 55 feet high, shall be of fireproof construction throughout.

Class D. Dwellings, Tenement Houses, and all other Residence Buildings not specified in Class C.

Buildings of this class over three stories, or 40 feet high, shall have the floor over cellar or basement which is nearest to grade level of fireproof construction.

Buildings of this class over four stories, or 55 feet high, shall be of fireproof construction throughout.

When the lower stories or portions thereof in non-fireproof buildings of Classes C. and D. are occupied for business purposes, the construction shall be made in accordance with the requirements in Section 44. Par. 7.

4. Business Buildings. When Required Fireproof.

Business buildings shall be construed to mean and include all structures used for or adapted to the transaction of business, the operation of machinery, the manufacture or storage of machinery or materials, the housing of live stock, or for any other industrial purpose.

Class E. Factories, Lofts, Office Buildings, Printing Houses, Restaurants, Stables, Stores, Warehouses, and Workshops.

Buildings of this class shall be governed by the specifications as set forth under "Classification of Buildings According to Construction."

Class F. Car Barns, Foundries, Light and Power Plants, Railroad Freight Stations, Ice Houses; also Special Industry Buildings constructed and occupied exclusively for a special purpose or industry and not otherwise classified, such as Coffee Roasters, Dry Cleaning Establishments, Grain Elevators, Ice-Making Plants, Laboratories, Malt Houses, Oil Houses or Refineries, Refrigerating Plants, Rendering Plants, Soap Factories, Sugar Refineries, Smoke Houses, Slaughter Houses, Wharf Buildings, also Garages accommodating more than three cars, or in which cars are stored on more than one floor.

Buildings of this class, such as oil houses, oil refineries, rendering plants, smoke houses, varnish works, etc., and buildings or portions of buildings which are used for the storage or handling of large quantities of combustible packing or refuse material, shall be only of fireproof construction. All other buildings of Class F. shall be of Class B. or Mill Construction if within the fire limits or if they exceed 55 feet in height.

Buildings of Class F., whether of fireproof construction and within the fire limits, or of non-fireproof construction and out-side the fire limits, shall only be erected in such isolated localities and under such conditions as are approved by the Building Inspector.

Storage of lumber shall not be permitted within the fire limits unless the stock is stored in sheds or buildings with incombustible walls and approved roofs.

5. Unless special exceptioin is made, every provision of this Code applying to any building of a class shall apply to all buildings of that class.

6. When any building is not classified, or where there is any doubt as to its classification, the Building Inspector shall designate under which class it shall be placed.

7. When any building is used for the purpose of two or more classes as herein defined, that portion devoted to the occupancy or use of a particular class shall be construed in accordance with the requirements of that class, unless such construction shall in the opinion of the Building Inspector prove impracticable, or where there shall be a conflict between the requirements of the different classes, in which case the class requiring the safest form of construction shall go over the entire building.

A public record of all classifications of buildings made by the Building Inspector shall be kept on file in the Department of Buildings in accordance with the provisions of Section 196 (Administration).

PART IV

AREA — HEIGHT

SECTION 33. **Permissible Area of Lot Occupied. Limits of Lot Area Occupied.**

1. Except as hereinafter provided. all buildings shall have uncovered spaces for providing light and air. These spaces shall be open to the sky from the top of the second story window sills and shall be in accordance with the following table; in which all paragraphs from 2 to 11 inclusive shall be read as if containing the words "except threaters, special industry buildings, and tenement houses."

(Lot area occupied by tenements, Sec. 276, National Code).

2. Buildings of Class C. on lots other than corner lots.

20 per cent of total lot area when not exceeding 75

feet in height. 25 per cent of total lot area when over 75 feet and not exceeding 125 feet in height.

Buildings of Class C. on corner lots:

15 per cent of total lot area when not exceeding six stories or 75 feet in height and shall increase 2 per cent for each additional story up to 125 feet in height.

3. All buildings not enumerated in paragraph 2 on lots other than corner lots:

10 per cent of total lot area when not exceeding 75 feet in height. 12½ per cent of total lot area when over 75 feet and not exceeding 125 feet in height.

4. All buildings not enumerated in paragraph 2 on corner lots not exceeding 2500 square feet in area:

5 per cent of total lot area when not exceeding 75 feet in height. 7½ per cent of total lot area when over 75 feet and not exceeding 125 feet in height.

5. When buildings are on corner lots, more than 2500 square feet in area, that portion of the building upon the excess lot area over and above 2500 square feet shall be provided with open spaces in accordance with the requirements of paragraphs 2 or 3, as the case may be of this section.

6. Every building (other than buildings of Class C) which occupies lots fronting upon three or more streets may occupy the entire lot area.

7. The total area of the uncovered spaces of all buildings which are more than 75 feet in width and occupy an entire block front facing upon three or more streets may be less by 25 per cent than is required by the provisions of paragraphs 3, 4, 5, and 6 of this section.

8. In all rear walls where windows occur, there shall be a clear space not less than 5 feet in width, at and above the second story window sills, between the rear line of every building and the rear line of every lot except corner lots. This shall not apply to buildings which extend through from one street to another.

9. In every court or yard the distance between opposite boundary walls shall be not less than 5 feet at any point for a height not exceeding 75 feet, and shall be at least ½ inch greater throughout its height for every additional foot above 75 feet.

10. When existing buildings are extended or increased in area, the ratio of total uncovered space to the area of the lot shall not be required to be greater

than it would be were the entire building erected in accordance with this Code.

11. In order to fulfill the requirements of this section, uncovered spaces may be increased in size as they go upward if thereby they provide at every given level the requisite area of uncovered space for a structure of that particular height.

SECTION 34. **Heights of Buildings.**

1. No building or structure hereafter erected, except church spires, water towers, smoke stacks or chimneys, shall exceed in height two and one-half times the width of the widest street upon which it fronts, nor shall it exceed the following limits:

	Height in Stories	Height in Feet.
Frame buildings used for purposes other than dwellings and tenements	2	30
Frame dwellings and tenements occupied by not more than two families	2½	30
Frame dwellings occupied by not more than one family	3	35
Buildings having bearing walls of hollow terra cotta or concrete blocks	3	40
Non-fireproof buildings, ordinary construction	4	55
Non-fireproof buildings, Mill construction	6	65
Fireproof buildings used for factories, stores, warehouses or workshops	7	85
Fireproof buildings used for other purposes than factories, stores, warehouses or workshops	10	125

2. If a single story building exceeds 30 feet in height the roof shall be constructed entirely of incombustible materials and all metal framework of same shall be protected with fireproofing, except as provided in Section 32, paragraph 2.

3. A single story building not exceeding 30 feet in height may have a roof monitor not exceeding 10 feet in height.

4. No story of any building above the first story in Class C. and D. buildings, shall exceed 15 feet in height.

SECTION 35. **Allowable Floor Areas.**

1. In every building of the character named in this section the maximum area of any floor between fire walls or exterior walls, either without or with a full equipment of automatic sprinklers, shall be as follows:

Fronting on	Without Sprinklers	With Sprinklers Increase of 66 2-3%
One street	5,000 sq. ft.	8,333 sq. ft.
Two streets	6,000 sq. ft.	10,000 sq. ft.
Three or more streets	7,500 sq. ft.	12,500 sq. ft.

Fronting on	Without Sprinklers	With Sprinklers Increase of 100 %
One street	8,500 sq. ft.	13,000 sq. ft.
Two streets	10,000 sq. ft.	16,000 sq. ft.
Three or more streets.	No restriction	20,000 sq. ft.

Area of frame building. Sec. 22

3 FIREPROOF CONSTRUCTION

(a) All buildings of classes A A-B.... Light and Power Stations, Office Buildings	No Restrictions as to Area

(b) All other buildings not exceeding 65 feet in height.

Fronting on	Without Sprinklers	With Sprinklers Increase of 66 2-3%
One street	10,000 sq. ft.	16,666 sq. ft.
Two streets	12,000 sq. ft.	20,000 sq. ft.
Three or more streets	15,000 sq. ft.	25,000 sq. ft.

(c) Stores, warehouses, factories, and workshops not exceeding 85 feet; and other buildings not exceeding 125 feet in height.

Fronting on	Without Sprinklers	With Sprinklers Increase of 50%
One street	7,500 sq. ft.	11,250 sq. ft.
Two streets	10,000 sq. ft.	15,000 sq. ft.
Three or more streets	12,500 sq. ft.	18,750 sq. ft.

(d) The first floor only of any fireproof building occupied as a store may have an area of 20,000 sq. feet., and if fully protected by approved automatic sprinklers may be increased 50 per cent or have a maximum area of 30,000 sq. ft.

PART V

LOADS

SECTION 36. **Allowable Loads. Floor Loads.**

1. Each floor of every building shall be of sufficient strength in all its parts to bear safely the weight to be imposed thereon, in addition to the weight of the floor itself. It shall safely support a minimum live load per square foot of area as specified in the following table:

CLASS OF BUILDING	
Theatres, Assembly Halls and Other Places of assemblage; Auditorium with fixed seats	70
Lobbies, passageways, stairways and auditoriums or places of assemblage without fixed seats	100
Dance Halls	100
Theatre stage	150
School Buildings, Libraries and Museums:	
Class rooms and rooms for similar use	60
Corridors, laboratories and similar public parts of the building	80
Hotels, Dwellings, Apartments and Tenement Houses, Club houses, Hospitals and places of Detention:	
Dwellings, first floor	40
Dwellings, floors above first	30
Private rooms and apartments(other than dwellings)	50
Public corridors, offices, lobbies, dining rooms, etc.	80
Office Buildings:	
First Floor	100
Floors above first	60
Grand stands	100
All stairs	100
Workshops, factories, and mercantile establishments	100
(In warehouses, workshops, factories and mercantile establishments used for the sale, storage or manufacture of heavy merchandise to carry all loads safely, but not less than 200 lbs. per square foot, including an allowance of at least 25 per cent for vibration where vibration occurs.)	
Roofs	30
Sidewalks	150
(In any building where the maximum floor load is more than 150 lbs. per sq. ft., the sidewalk must be designed to safely carry such maximum load.)	

Wind pressure, 30 lbs. per sq. ft. of exposed surface.

(Definition of live load—Section 15.)

2. No safe shall be placed on a stair landing or in a stair hall, nor shall its weight be carried by any beam which also carries the floor of any stair landing or stair hall.

(Stair, and stair-landing loads section 96. Par. 2.)

ROOF LOADS

1. Every roof with a pitch of less than 20 degrees with the horizontal, shall be proportioned to bear safely a live load of 30 pounds per square foot of surface. If the pitch be more than 20 degrees, the live load shall be assumed to be 30 pounds per square foot measured on a horizontal plane.

COLUMN LOADS

1. Every column, post, or other vertical support shall be of sufficient strength to bear safely the combined live and dead loads transmitted to it.

(Column eccentrically loaded, Sec. 48, par. 5.)

2. In buildings more than five stories in height, the following reductions are permissible: For columns supporting each succeeding floor, a reduction of 5 per cent of the total live load per floor may be made, but the total deduction shall not exceed 50 per cent.

3. No reduction of live load or columns shall be permitted in buildings where the assumed floor load is more than 120 pounds per square foot and is likely to be permanent in character, as in warehouses, printing houses, machine shops, etc.

4. For structures carrying machinery, such as cranes, conveyors, printing presses, etc., at least 25 per cent shall be added to the stresses from live loads to provide for effect of impact and vibrations.

SECTION 37. **Strength of Existing Floors to be Computed.** In every existing building of Classes E and F, erected and occupied before the adoption of this Code, the weight that each floor will safely sustain shall be computed by a competent person employed by the owner or occupant. Such computations shall be filed in the office of the Building Inspector with an affidavit by the persons making the same, in such manner as the Building Inspector may direct, and shall give full information on which the computations are based. When the safe live loads on any existing floor thus ascertained has been approved by the Building Inspector, he shall post one or more copies of such approved live load in such conspicuous place or places on each story as may be designated by the Building Inspector, and no floor shall be loaded in excess of the safe allowance mentioned in said posted copy.

PART VI

EXCAVATIONS AND FOUNDATIONS

SECTION 38. **Excavations.** The person causing any excavation to be made for a building, shall have the same properly guarded and protected. Wherever necessary he shall at his own expense properly sheath, pile and erect masonry or steel construction, or sufficient retaining wall to permanently support the adjoining earth. Such retaining wall shall extend from full depth of excavation to the level of the adjoining earth and shall be properly coped.

1. Excavations Affecting Adjoining Property. Whenever an excavation is not intended to be or shall not be carried to a depth of more than 11 feet below the curb level, the owner of every adjoining or contiguous wall or structure. yard, or bank of earth or rock shall protect the same, so that they shall be and remain as safe as before such excavation was begun. Such owner shall be permitted to enter upon the premises where the excavation is being made when necessary for this purpose.

2. Whenever an excavation of either earth or rock for buildings or other purposes shall be intended to be or shall be carried to the depth of more than 11 feet below the curb, the person causing such excavation to be made shall at all times from the commencement until the completion thereof, if accorded the necessary license to enter upon the adjoining land, and not otherwise, at his own expense preserve any adjoining or contiguous wall, structure, yard or bank of earth or rock from injury, and support the same by proper foundation or retaining walls, so that the said walls, structures, yard or bank of earth or rock shall be and remain practically as safe as before such excavation was commenced, whether the said adjoining or contiguous wall, structure, yard, or bank of earth or rock are down more or less than 10 feet below or above the curb. For this purpose such foundations or retaining walls may be built upon the property upon which the wall, structure, yard, or bank of earth or rock is situated if the necessary license is not accorded to the

person or persons making such excavation, then it shall be the duty of the owner refusing to grant such license at his own expense to make the adjoining or contiguous wall, structure, yard, or bank of earth or rock safe, and support the same by proper foundations so that adjoining excavations may be made, and shall be permitted to enter upon the premises where such excavation is being made for that purpose, when necessary.

SECTION 39. **Foundations Adjoining Party Walls.**

1. In case a party wall is intended to be used by a person causing an excavation to be made, and the footings and foundations of such party wall are in good condition and sufficient for the uses of both the existing building and the new one, then the person causing the excavations to be made shall, at his own expense, preserve such party wall from injury and support same by proper means, so that said party wall shall be and remain as safe as before the excavation was begun.

2. In case the footings and foundations of any said party wall are not in good condition, or not sufficient for the uses of both the existing building and the new one, it shall be the duty of the person causing the excavation to be made to extend such defective or insufficient footing, or foundation, or to replace same with new footing or foundation. Such extended or new footing shall project on each side of the party line such distance as to bring the center of the footing under the center of the wall, so that the total load upon the wall may be uniformly distributed over the area of the footing. Any other method may be used which will adequately support the party wall. In order that this may be done, the person causing the excavation to be made shall be allowed access to the adjoining premises.

3. In case any excavation or the removal of any existing building shows any adjoining wall or structure to be unsafe at the time the excavation was begun, it shall be the duty of the person causing the excavation to be made, or the building removed, to forthwith report the fact in writing to the Building Inspector, who shall upon receipt of such notice, forthwith cause an inspection of such adjoining premises to be made, and if such inspection proves the aforesaid wall or structure to be unsafe, it shall be the duty of the Building Inspector to declare such wall or structure to be unsafe and cause the same to be repaired as herein provided.

4. If the person whose duty it shall be to preserve or protect from injury any wall or structure shall neglect or fail to do so within 24 hours after the receipt of a notice from the Building Inspector, then the Building Inspector may enter upon the premises and employ such labor and furnish such materials and take such steps as, in his judgment, may be necessary to make the premises safe and secure, or to prevent the same from becoming unsafe or dangerous, at the cost and expense of the person whose duty it is to keep the same safe and secure.

SECTION 40. **Bearing Capacity of Soil.**

1. When doubt arises as to the safe sustaining power of the soil upon which a building is to be erected, the Building Inspector may order borings to be made, or he may order tests of the sustaining power of the soil to be made by and at the expense of the owner of the proposed building. Such tests shall be made in accordance with specifications established by the Building Inspector, and he shall be notified before any test is made, so that he may be present or represented thereof. The records of such borings or tests shall be filed in the Bureau of Buildings.

2. The safe bearing capacity of different soils shall be as determined by the Building Inspector, and in the absence of tests shall not exceed the values given in the following table:

Character Of Soil	Tons per square foot
Soft clay	1
Firm clay, fine sand, or layers of sand and clay, wet	2
Clay or fine sand, firm and dry	3
Hard clay, course sand, gravel	4
Hard pan	8 to 15
Rock	15 to 72

SECTION 41. **Foundation Walls.**

1. Foundation walls shall be construed to include all walls and piers built below the curb level, or nearest tier of beams to the curb, or to the average level of the ground adjoining the walls, to serve as supports for walls, piers, columns, girders, posts or beams.

2. If built of rubble stone, they shall be at least 8 inches thicker than the wall next above them to a depth of 12 feet below the curb level; and for every additional 10 feet, or part thereof deeper, they shall be increased 4 inches in thickness.

3. If built of brick or plain concrete and supporting walls over 30 feet in height, they shall be at least 4 inches thicker than the wall next above them to a depth of 12 feet, or part thereof deeper, they shall be increased 4 inches in thickness. In buildings not exceeding 30 feet in height, the Building Inspector may at his discretion permit the foundation walls to be the same thickness as the walls above.

4. Hollow blocks may be used for the foundation walls of buildings not exceeding three stories or 40 feet in height, provided said walls are not less than the thickness required for foundation walls of brick or plain concrete. All blocks shall be laid with cells vertical the stability of the walls and their resistance to water, may be increased by being filled solidly with wet concrete. Such foundations shall not be stressed beyond the limits allowed in Section 58, taken over combined area of blocks and fill.

5. Portland cement mortar only, shall be used in footings and foundation walls.

Footings. 1. The footings for foundation walls, piers, and columns, shall be constructed of plain concrete, reinforced concrete or of steel grillage beams resting on a bed of concrete. Wooden footings may be used if they are entirely below the level of low water.

2. Footings shall be so designed that the loads they sustain per unit of area shall be as nearly uniform as possible, and the stresses shall conform to the requirements of this Code. The dead loads carried by the footings shall include the actual weight of the superstructure and foundations down to the bottom of the footing. All tanks or other receptacles for liquids shall be figured as being full. All vaults or similar built-in structures shall be considered parts of the building.

The live loads on column footings shall be assumed to be the same as the live load in the lowest tier of columns.

3. Loads exerting pressure under the footings of foundations of buildings more than three stories in height, shall be computed as follows:

(a) For buildings in which the required live loads does not exceed 75 pounds per square foot, assume the total dead load, plus 60 per cent of the full live load.

(b) For buildings in which the required live load exceeds 75 pounds per square foot, assume the total dead load plus 75 per cent of the full live load.

In no case shall the load per square foot under any portion of any footing due to the combined dead, live, and wind loads, exceed the safe sustaining power of the soil upon which the footing rests.

4. Concrete footings shall be not less than 12 inches thick, except as provided in section 28.

5. Concrete for footings shall be made of at least one part of Portland cement, and not more than two and one-half parts sand, and five parts of broken stone or gravel.

6. Broken stone shall be hard, durable, and of quality approved by the Building Inspector. Where gravel is used it shall be thoroughly washed.

7. Where mass concrete is used for footings or foundations, the stone or gravel shall be such size as will pass through a two-inch ring, and shall be free from dust or other deleterious material. Sufficient smaller aggregate shall be added to secure density.

8. Stepped up courses of brick shall have offsets of not more than ½ inch if laid in single courses, and 1 inch if laid in double courses.

9. If the nature of the ground and the character of the buildings are such as to make it necessary or advisable, isolated piers may be used instead of a continuous wall to support the building.

10. Grillage beams shall be united by bolts and separators, and the grillage filled solid with concrete. All metal which forms parts of any footing or foundation shall be protected from rust, by a wash of rich Portland cement grout, or by the use of other approved coating, and shall be entirely encased with at least 4 inches of concrete.

SECTION 42. **Pile Foundations.**

Wooden piles intended for a wall, pier or post to rest upon, shall not be less than six (6) inches in diameter at the smallest and twelve (12) inches at the butt end, and shall be of oak, fir, cedar or other suitable wood, and shall be driven to a solid bearing.

Safe loads on piling shall be computed on the following formula:

$$\frac{2\ w\ h}{s \text{ plus } 1} \text{ in tons}$$

in which w—weight of hammer, in tons.
h—height of fall of hammer in feet.
s—penetration in inches under last blow, or the average under last five (5) blows.

No wooden piles shall be weighed with a load exceeding twenty-five (25) tons.

The top of all piles shall be cut off level, and the tops of all ranging and capping timbers, when used, shall be placed below the lowest ground water level to insure moisture in the timber. Where required Portland cement concrete shall be rammed down in the interstices between the heads of the piles, and for one (1) foot in width outside of the piles. Concrete piles shall be designed in accordance with the provisions under Section 43.

SECTION 43. **Concrete Piles.** 1. Piles consisting of steel tubes filled with concrete shall have a minimum inside diameter of 10 inches and the thickness of the metal tube not less than three-eighths inch. The length shall not exceed forty times the inside diameter. The ends of the tube shall be faced perpendicular to its axis. No more than one splice of an approved design shall be used in the total length of the pile. When driven to rock the load on such piles shall not exceed 500 lbs. per square inch on the concrete and 7500 lbs. per square inch on the steel. In computing the effective area of the steel, one-eighth inch of its thickness shall be deducted from the thickness of the tube to allow for corrosion.

2. Concrete piles moulded and cured before driving shall be provided with not less than 2 per cent nor more than 4 per cent of longitudinal reinforcement with bands or hoops not less than three-eighths inch diameter, and spaced not further apart than 6 inches. The average diameter of the pile shall not be less than 12 inches, and the diameter at the foot not less than 8 inches. The length shall not exceed thirty times the average diameter for the piles driven through firm soil, and shall not exceed fifteen times the average diameter for piles driven through to rock through loose wet soil, or filled ground. When driven to rock the maximum load carried on such piles shall not exceed 7500 lbs. per square inch on the longitudinal reinforcement and 500 lbs. per square inch on the concrete at the average cross section.

The top of the piles shall be protected with a cushion cap of approved design, and when driven to rock the foot shall be provided with a metal shoe having a square bearing.

3 When piles of the types described in paragraphs 1 and 2 are not driven to rock their carrying capacity shall be determined by means of one or more test piles, and the working load shall not exceed one-half the test load under which the pile begins to settle, nor shall the prescribed unit stresses be exceeded.

4. Concrete piles cast in place shall be made in such a manner as to insure the exclusion of any foreign matter, and to secure a uniform full-sized section for the entire length. The average diameter of the pile shall not be less than 14 inches and the diameter at the foot not less than 8 inches. The length shall not exceed twenty-five times the average diameter. The carrying capacity of such piles shall be determined by means of one or more test piles, and the allowable working load shall be not greater than one-half the test load under which the test pile begins to settle, nor greater than 350 lbs. per square inch.

5. The concrete shall be mixed in the proportion of one part Portland cement, two parts of clean coarse sand, and four parts of broken stone or gravel of a size passing through a 1¼ inch diameter ring, with sufficient water to produce a plastic or viscous consistency.

6. The clear space between the heads of concrete piles shall not be less than 16 inches.

7. The permissible load upon piles driven out of plumb, and the extent to which piles may be driven out of plumb before being condemned, shall be determined by the Building Inspector.

8. No pile or group of piles shall be loaded eccentrically.

PART VII

EXISTING BUILDINGS RAISED, ALTERED, REPAIRED OR MOVED

SECTION 44. **Buildings Raised, Altered, Repaired or Moved.** 1. Within the fire limits every existing building having a combustible roof, if raised to produce an additional story, shall be provided with an incombustible roof.

2. No building within the fire limits having masonry walls shall be enlarged or built upon unless the addition to the exterior walls be of approved incombustible materials.

3. No existing building shall be altered to exceed the limits of height or area provided by this Code

for new buildings of the same class as that to which the additions are to be made.

4. No existing frame building shall be raised to a height exceeding 30 feet, except that dwellings occupied by not more than one family, may be raised to 35 feet. Buildings so raised shall comply with paragraph 1 and all the requirements of this Code relating to frame buildings.

5. Within the fire limits no frame building more than two stories in height shall be altered to be used as a factory, warehouse or stable.

6. No frame building within the fire limits shall be increased in area or height by frame additions, except that frame extensions to be used exclusively for toilet purposes may be permitted, but any such extension shall have an approved roof covering.

7. Any frame building within the fire limits which may hereafter have the first story converted into a store, shall have the walls, partitions and ceiling of such first story covered with metal lath or one-half inch fibre plaster board and plastered to a total thickness of at least three-fourths inch; or the plaster board may be covered with sheet metal. Fire stops shall also be provided at the line of the ceiling to cut off all connection to stories above through hollow stud partitions or side walls.

8. Any existing frame building within the outer or inner fire limits or Class C Building within the inner fire limits which may be damaged by fire, decay or otherwise to an amount greater than one-half of its value exclusive of the foundation, shall not be repaired or rebuilt, but shall be immediately removed.

In case the owner of the damaged building shall be dissatisfied with the decision of the Building Inspector that such building is damaged to a greater extent than one-half of its value exclusive of the foundation, the amount and extent of such damage shall be determined upon an examination of the building by three competent persons, one of whom shall be appointed by the Building Inspector, another shall be appointed by the owner of the building and the third shall be appointed by the Insurance Adjuster............ Board of Fire Underwriters: a decision of a majority of these surveyors reduced to writing and sworn to, shall be conclusive, and such building shall in no manner be repaired or rebuilt until such decision shall have been rendered.

9. No Class D building shall be moved from without to within fire limits.

10. No building shall be moved until a permit has been obtained from the Building Inspector and he shall not issue such permit if in his judgment the proposed new location of the building would seriously increase the fire hazard of the surrounding buildings.

PART VIII

TESTS, QUALITY, AND WEIGHT OF MATERIALS

SECTION 45. **Strength Test Requirements.** 1. All building materials shall be of a quality to meet the requirements of this Code, and the test specifications promulgated by the Building Inspector.

2. All tests shall be conducted under the supervision or direction of the Building Inspector. Laboratory tests shall be made at some Testing Laboratory of recognized standing by a reputable, competent, and disinterested expert acceptable to the Building Inspector. The tests shall be at the expense of the owner or builder. The test certificate shall state the source of the test specimens, the method of test, and result obtained. Original signed copies of the certificate shall be furnished the Building Inspector and shall be kept on file in his office subject to public inspection.

3. The Building Inspector may at his discretion accept certified reports of tests made by responsible persons provided such reports show that the material, appliance or method of construction have met the test requirements of this Code.

4. Materials, appliances or methods of construction which have been tested and approved shall be used and installed in the same manner in which they were tested for approval.

5. Additional tests shall be made from time to time at the discretion of the Building Inspector.

Brick. 1. All bricks used in buildings, except those used for fire-stopping, Section 73 and 29, par. 5, shall be sound, hard, burned, or other approved brick of regular shape. Second-hand brick shall be thoroughly cleaned before being used. No more than 15 per cent shall be bats or broken brick.

2. Brick tested for approval shall develop an average strength of 3000 lbs. per square inch, and no sample shall fall below 2000 lbs. per square inch. Brick shall be tested flatwise (half bricks permitted) and the average shall be taken on at least five samples. The average allowable absorption shall not exceed 25 per cent.

Sand. Sand used for building construction shall be sharp, clean, coarse and silicious.

Lime. 1. Slacked lime (lime putty) shall be made from well-burned quick lime, free from ashes, clinker, and other foreign material.

2. Dry hydrated lime shall be finely divided product resulting from mechanically slaking pure quick lime at the place of manufacture.

3. Lime shall be of quality to meet the specifications of the American Society for Testing Materials.

Lime Mortar. Lime mortar shall be made of one part by volume of slaked lime (lime putty), or dry hydrated lime, and not more than four parts by volume of sand.

Cements. Portland cement and Natural cement shall meet the respective requirements of the current Standard Test Specifications of the American Society for Testing Materials for those cements, and any other requirements of the Building Inspector. No caked or lumpy cement shall be used.

Cement Mortar. 1. Cement mortar shall be made of cement and sand in the proportions of one part of cement and not more than three parts of sand by volume.

2. Except in chimneys, not more than 15 per cent of the cement by volume may be replaced by an equal volume of dry hydrated lime. The lime and cements shall be thoroughly mixed before the addition of water. The mortar shall be used immediately after water is added.

3. Cement-lime mortar shall be made of one part of cement, one part of slaked lime or dry hydrated lime, and not more than three parts of sand to each. All materials to be measured.

Gypsum Mortar or Plaster. A mortar or plaster composed of one part retarded gypsum, and not more than 3 parts sand, with binding material when necessary for Gypsum Blocks, see Section 15.

Building Blocks. 1. The term "block" as used in this section shall mean any shape of block, brick, or tile which forms a hollow or cellular wall.

2. Terra Cotta blocks for bearing walls shall be dense, and hard-burned or vitreous.

Portland cement only shall be used in the manufacture of concrete blocks, and the coarse aggregate shall be of suitable material graded in size, but in no case shall the maximum dimension exceed one-half the width of the minimum section of the finished block.

3. All building blocks used for bearing walls shall be marked or branded for identification and such marks or brands shall be registered with the Building Inspector. No make of blocks shall be used in any structure until the requisite number of samples have successfully met the test requirements of this section, and have been approved by the Building Inspector.

Tests shall be made to establish the working stresses to govern the use of blocks of each particular mark or brand. A series of ten full-size blocks shall be selected by the Building Inspector from average quality stock, either at the factory, or from stock delivered for use at a building, and shall be tested for compression.

4. Concrete blocks shall be not more than 36 days old when tested.

5. The compressive strength of building blocks shall in all cases be calculated upon the gross sectional area of the bedding faces including the cellular spaces.

All blocks submitted to test shall be bedded in plaster of paris or cement to secure an even bearing.

Two piece blocks shall be tested in pairs as set to form the two faces of the wall. The strength requirements shall be the same as for hollow blocks, and it shall be calculated upon the gross sectional wall area which would be formed by the two blocks and the space between them.

6. The average ultimate compressive strength for terra cotta blocks designed to be normally laid with the cells vertical, and which are tested with the cells in that position, shall be not less than 1200 lbs. per square inch. The allowable working stress on such blocks shall not exceed 120 lbs. per square inch.

7. The average compressive strength of terra cotta blocks which are designed to be normally laid with the cells vertical, but are tested with the cells horizontal, shall be not less than 300 lbs. per square inch, no block of the set shall test less than 200 lbs. per square inch. The allowable working stress on such blocks when laid with cells horizontal, shall not exceed 30 lbs. per square inch.

8. The average compressive strength for concrete blocks when tested with the cells vertical, shall be not less than 800 lbs. per square inch, and 300 lbs.

per square inch with no block testing less than 200 lbs. per square inch if tested with the cells horizontal. The allowable working stress for such blocks shall not exceed 80 lbs. and 30 per square inch respectively.

9. The average ultimate compressive strength for terra cotta blocks designed to be normally laid with the cells horizontal, and which are tested with the cells in that position, shall be not less than 800 lbs. per square inch. The allowable working stress on such shall not exceed 80 lbs. per square inch.

10. Hollow building blocks may be filled solidly with Portland cement, concrete or cement mortar to increase the stability and to aid in distributing the load, but the allowable working stress on such blocks shall not be greater than that permitted for unfilled blocks.

11. The absorption of building blocks used for bearing or panel walls, determined by taking the average test, of three blocks shall not exceed 10 per cent in 48 hours, and shall not exceed 15 per cent in any case.

12. Hollow building blocks shall not be used in fireproof buildings until they have successfully withstood a two-hour fire test as specified for partitions in Section 144 National Code.

Terra Cotta Floor Tile. Terra cotta floor tile, when tested on end and faced with Portland cement, shall give an average compressive strength of not less than 2500 lbs. per square inch of net area. The average strength shall be computed from the results of test of ten average tile.

Concrete. 1. All mass concrete shall consist of a medium wet or plastic mixture of cement, sand, and stone, gravel, or other hard durable material, of such proportions as shall be approved by the Building Inspector unless specified by this Code. The sand and cement shall be of a quality specified by this Code, and the coarse aggregate, where not specified by this Code, shall be as approved by the Building Inspector.

2. All concrete shall be mixed, deposited and protected as required for reinforced concrete in Section 120 to 175.

3. All forms and centering shall be built plumb and to true lines in a substantial manner, with joints sufficiently tight to prevent leakage of the cement mortar. They shall be properly supported and braced to safely sustain both the dead load and live load that may be placed upon them during construction.

Section 45

4. All tests on concrete shall be made in accordance with the requirements of this Code, but the test strength of concrete other than that used with reinforcement shall be as specified by the Building Inspector.

Structural Timber. All timbers and wooden beams used in building shall be of good sound material, free from rot, large and loose knots, shakes, or any imperfection whereby the strength may be seriously impaired.

Structural Steel And Iron. 1. All wrought and cast structural steel and iron shall conform to the test requirements of the current Standard Specifications of the American Society for Testing Materials.

2. **Rivet Steel** shall have an ultimate strength of 46,000 to 56,000 lbs. per square inch.

3. All other structural steel shall show an ultimate strength of 55,000 to 65,000 lbs. per square inch.

4. No second-hand rolled shapes shall be used in any structure without written permission of the Building Inspector.

5. **Steel Castings** shall be made from open hearth steel or soft or medium grade, and shall be practically free from blowholes, with a reasonably clear skin and sharpness to pattern, and shall show an ultimate tensile strength of 60,000 to 70,000 lbs. per square inch.

6. **Cast Iron** shall be of good foundry mixture, producing a clean, tough, gray iron. Castings shall be free from serious blowholes, cinder spots, and cold shuts. Transverse tests on cast iron shall be made upon the 1½ inch diameter "Arbitration Bar" of the American Society for Testing Materials. The bar to be supported on 12-inch centers, loaded at the middle, and in no case shall it test at less than 2900 lbs. Tensible tests optional.

Weights of Materials. The weights of various materials shall be assumed to be as follows:

	Pounds per cubic foot
Brickwork, Ordinary	120
Brickwork—Pressed brick	130
Concrete—cinder, used for floor arches or slabs, Well tamped	108
Concrete—Cinder, used for filling, not tamped	60
Concrete—Stone or gravel	150
Granite, Bluestone and Marble	170
Limestone	160
Sandstone	145
Oak	50

Spruce and Hemlock	30
White Pine	27
Yellow pine Grade I	42
Yellow Pine Grade II	35
Maple	43
Birch	45
Douglas Fir and Cypress	35

PART IX

WORKING STRESSES

SECTION 46. **Computations For Working Stress.**

1. The required dimensions of each piece of material and of each form of construction to be used in this Code, supplemented by those which may be promulgated by the Building Inspector.

2. **Factors of Safety.** Where the Code furnishes neither a unit working stress, nor a factor of safety for a material, the relation of allowable working stress to ultimate strength shall be determined by the Building Inspector.

SECTION 47. **Permissible Working Stresses.** 1. The safe carrying capacity of the various materials of construction, when not otherwise specified, shall be determined by the following working stresses in pounds per square inch of sectional area:

2. **Steel and Iron:**

	Lbs. Per Square inch
COMPRESSION IN SHORT BLOCKS	
Rolled Steel	16,000
Cast Steel	16,000
Cast Iron	16,000
Steel Pins, shop and power driven field rivets (bearing)	20,000
Steel field rivets, Driven by hand (Bearing)	16,000
Steel field bolts (Bearing)	12,000
TENSION	
Rolled Steel	16,000
Cast Steel	16,000
SHEAR	
Steel web plate	10,000
Steel shop and power driven field rivets and pins	10,000
Steel field rivets (Driven by hand)	8,000
Steel field bolts	7,000
Cast steel	9,000
Cast iron	1,500

EXTREME FIBRE STRESS

Rolled steel beams, and riveted steel beams	16,000
Rolled steel pins, rivets, and bolts	20,000
Cast iron compression side	16,000
Cast iron tension side	2,500

3. **Concrete And Masonry.**

CONCRETE AND MASONRY COMPRESSION

	Lbs per Square inch
Grout, Portland cement, neat	800
Grout, Portland cement, neat between steel in foundation not over ½ inch	1,200
Concrete, Portland cement, 1; sand, 2; stone, 4	400
Concrete, Portland cement, 1; sand, 2½; stone, 5	300
Concrete, Natural cement, 1; sand, 2; stone, 4	125
Concrete, Natural cement 1; sand, 2½; stone, 5	80
Brickwork in Portland cement mortar	210
Brickwork in Natural cement mortar	208
Brickwork in lime and Portland cement mortar	170
Brickwork in lime mortar	140
Hollow terra cotta blocks	120
Hollow concrete blocks	100
Rubble stonework in Portland cement mortar	170
Rubble stone work in lime and cement mortar	140
Rubble stonework in lime mortar	85
Cut stone masonry, other than sandstone	330
Sandstone masonry	250
Granites, according to test	1,000 to 2,400
Gneiss	1,000
Limestones, according to test	700 to 2,300
Marbles, according to test	600 to 1,200
Sandstones, according to test	400 to 1,600
Slate	1,000

SHEAR

Shearing stress involving diagonal tension in Portland cement concrete, in the proportions of 1-2-4 40

Direct shear (punching shear), in Portland cement concrete, in the proportions of 1-2-4 120

4. **Structural Timber.** The following stresses apply to seasoned timber to be kept under shelter in a dry location, and deflection not to increase with time. If the timber is to be used under other conditions, these stresses should be modified.

	BENDING		COMPRESSION	
	Extreme Fibre Stress	Maximum Longitudinal Shear	Perpendicular to the Grain	Parallel to the Grain. Columns with $\frac{l}{d}$ less than 10
Oak	1,400	120	400	1,000
Yellow Pine, Grade I	1,600	120	350	1,200
Yellow Pine, Grade II	1,200	85	300	900
Douglas Fir	1,600	150	400	1,500
Western Spruce	1,000	75	200	1,200
Western Hemlock	1,300	75	290	1,500
Norway Pine	1,000	75	250	800

l—unsupported length in inches.
d—diameter or least side in inches.

Where a moderate increase in deflection after first placement of the load is not objectionable, the compression and extreme fibre stresses here given may be increased 10 per cent. Stresses for timbers subject to vibration and impact, should not be thus increased.

Except for shear, the same stresses may be used for Douglas Fir of Grades I and II as for Yellow Pine of Grades I and II, provided the fir is selected in a manner to insure material of corresponding quality.

SECTION 48. **Working Stresses For Columns.** 1 The working stresses per square inch for all steel, cast iron, or wooden columns having flat ends shall not exceed the values given by the following formulas.

2. **Steel Columns.** Working stress. S-16.000-70 $\frac{l}{r}$
Where s—allowable compression in lbs. per square inch.
l—allowable length in inches.
r—least radius of gryration in inches.

The allowable compression (S) shall not exceed 13,000 lbs. per square inch, and the ratio of slenderness $\frac{l}{r}$ shall not exceed 120, except that for bracing and for compression members resisting wind stress only, $\frac{l}{r}$ shall not exceed 150.

3. **Cast Iron Columns.** Working stress, S—9000-40 $\frac{l}{r}$ Maximum $\frac{l}{r}$ shall not exceed 60.

4. **Wooden Columns.**

	For columns with $\frac{l}{d}$ greater than 10 but not exceeding 30
Oak	1,200-20 $\frac{l}{d}$
Yellow Pine, Grade I	1,400-20 $\frac{l}{d}$

Yellow Pine, Grade 11	$1{,}100-20\frac{l}{d}$
Douglas Fir	$1{,}300-20\frac{l}{d}$
Spruce	$1{,}100-20\frac{l}{d}$
Western Hemlock	$1{,}200-20\frac{l}{d}$
Norway Pine	$1{,}000-20\frac{l}{d}$

l—unsupported length in inches.
d—diameter or least side in inches.

The unsupported length of wooden columns and compression members shall not exceed 30 times the diameter or least side, nor shall the unit stresses exceed those given in the table for $\frac{l}{d}$ less than 10.

5. **Columns Eccentrically Loaded.** The stresses of every column which is eccentrically loaded shall be computed. The sum of the stresses due to the eccentricity added to all other stresses shall in no case exceed the working stresses stated in this Code.

The eccentric load of a column shall be considered to be distributed equally over the entire area of the column at the next point below that at which the column is securely braced laterally in the direction of the eccentricity.

SECTION 49. **Wind Pressure.** 1. All buildings or parts of buildings in which the height is more than three times the minimum horizontal wind pressure, in any direction of 20 lbs. for every square foot of exposed surface. Wind bracing shall be provided by making the connection joint between girders and columns sufficient for the vertical load as well as the bending due to side pressure; or diagonal bracing shall be placed between columns, proportioned to transfer the shear of the side pressure to the footings. All details shall be designed to carry the stresses in the main members.

2. The overturning moment due to wind pressure shall not exceed 50 per cent of the moment of stability of the structure, unless the structure is securely anchored to the foundation. The anchors shall be of sufficient strength to safely carry the excess overturning moment, without exceeding the allowable unit stresses given in this Code.

3. When the stress due to the wind in any member or connection amounts to less than 50 per cent of the total live and dead loads, it may be neglected. When the stress due to the wind exceeds 50 per cent of the stress due to the combined live and dead loads, all these stresses shall be added together and the al-

lowable unit stress for the total may be taken at 50 per cent. in excess of the values stated in Sections 47 and 48. In no case shall the section be less than required if wind forces be neglected.

4. In the design of circular chimneys, the area subject to wind pressure may be assumed as 60 per cent of the diametral area.

PART X

CAST IRON AND STEEL CONSTRUCTION

SECTION 50. **Cast Iron Construction. Cast Iron Columns.** 1. The outside diameter or least side of cast iron columns shall be not less than 5 inches, nor shall their unsupported length exceed sixty times their least radius of gyration.

2. The finished thickness of metal in the shaft shall not be less than one-twelfth the outside diameter or the greatest lateral dimension of cross section, nor less than three-fourths inch. The thickness of metal in flanges, lugs, seats, and brackets shall be not less than three-sevenths inch.

3. In all cast-iron columns not cast with one open side, at least three holes three-eighths inch diameter shall be drilled 90 degrees apart near the middle of the shaft for the purpose of measuring the thickness of metal.

4. Whenever the core of a cast iron column has shifted more than one-fourth the thickness of the shell, the strength shall be computed assuming the thickness of metal all around equal to the thinnest part, and the column shall be rejected if this computation shows the strength to be less than required by Section 45, Structural Steel and Iron.

5. A cast iron column shall be rejected whenever blow-holes or other imperfections reduce the effective area of the cross-section more than 10 per cent.

6. The ends of all cast iron columns shall be planed to a true surface perpendicular to the axis of the column. Successive column lengths shall be bolted together through end flanges with at least four bolts not less than three-fourths inch in diameter. No shims shall be used between the flanges.

7. If the core of a cast iron column below a joint is larger than the core of the column above, the core of the lower column shall be tapered up for a distance of not less than six inches, to the size of the core of the column above. In lieu of tapering the core, a steel or cast iron plate of sufficient thickness may be used

between the flanges. The difference between the diameter or sides of any two successive column lengths shall not be greater than 2 inches.

8. The connection of beams and girders to cast iron columns shall be effected by means of seats reinforced by brackets of sufficient depth and thickness to support the entire load, and by lugs to which the webs of the beams and girders shall be bolted. The projection of the seat beyond the face of the column shall in general be not greater than 4 inches.

9. All holes in cast iron columns shall be drilled. Cored, or cored and reamed holes shall not be permitted. The diameter of holes shall not exceed that of the bolts by more than one-sixteenth inch. The distance from the center of a hole to the edge of a flange or lug shall be not less than one and one-half inches.

10. Cast iron columns, shall not be used in any case where the load is sufficiently eccentric to reduce the unit compression to zero in the extreme fibre on one side of the axis of the column.

11. Cast iron columns shall not be used in the structural frame of buildings, the height of which is greater than three times their width.

12. Cast iron columns shall not be painted or covered until after inspection by the Bureau of Buildings.

SECTION 51. **Cast Iron Bases and Lintels.** 1. Cast iron bases or shoes shall be planed on top. Bases which rest on steel girders shall be planed top and bottom. The thickness of metal shall be not less than one inch. The inclination of the outer edge of the ribs with the horizontal shall be not less than forty-five degrees. Whenever one side of the bed plate exceeds three feet in length a reinforcing flange at least three inches high shall be provided.

2. Cast iron lintels shall be not less than three-fourths inch in thickness, and shall not be used for spans exceeding six feet.

SECTION 52. **Steel Construction. Rolled Steel Columns.** 1. No rolled steel column shall contain material whether in the body of the column or used as lattice bar or stay-plate of less thickness than one-fourth inch.

2. In steel columns built up of a web plate and angles and having an unsupported length greater than sixty times the least radius of gyration, the thickness

of metal in the angles shall be not less than one-twelfth the width of the outstanding legs of the angles.

3. The unsupported length of a rolled steel column shall not exceed one hundred and twenty times its least radius of gyration, nor forty times its least lateral dimension or diameter.

4. The ends of all columns shall be faced to a plane surface at right angles to the axis of the columns. Wherever practicable, the connections between them shall be made with splice plates. When the sections of the columns to be spliced are such that splice plates cannot be used, a connection formed of plates and angles designed to properly distribute the stress may be used.

5. Where any part of the section of a column projects beyond that of the column above, the difference shall be made up by filling plates secured to the column by the proper number of rivets.

6. The pitch of rivets at the ends of built up columns shall not exceed four diameters of the rivets for a length equal to twice the greatest lateral dimension of the column.

SECTION 53. **Steel Girders and Beams.** 1. The thickness of the web in built up girders shall be not less than one-one hundred and twentieth of the distance between the flange angles or stiffeners, nor less than one-fourth inch.

2. When the unsupported length (l) of the compression flange of a girder exceeds ten times its width (b) the unit stress in such flange shall not exceed $19{,}000-300\frac{l}{b}$ but in no case shall the unsupported length of the compression flange exceed forty times its width.

3. Stiffeners shall be provided over supports and under concentrated loads; they shall be of sufficient strength as a column to carry the loads and shall be connected with a sufficient number of rivets to transmit the stress to the web plate.

If the unsupported depth of the web plate exceeds sixty times its thickness, intermediate stiffeners shall be provided. All stiffeners shall be in pairs with close bearing against the flange angles.

4. When rolled steel beams are used in pairs to form girders they shall be connected together by bolts and iron or steel separators at intervals of not more than five feet.

All beams twelve inches and over in depth shall have at least two bolts to each separator.

5. Beams supported by girders shall be riveted or securely bolted to the same.

6. Every beam, lintel, or girder supported by a wall, shall be properly anchored thereto and shall rest upon a steel or iron plate so designed as to properly distribute the load over the masonry.

SECTION 54. **Framing And Connecting Structural Steel Work.** 1. Steel girders, columns, beams, trusses, and other steel work of floors and roofs shall be well and firmly connected together, and to the walls.

2. All beams framed into other beams, girders or columns shall be connected thereto either by angles or knees with sufficient rivets or bolts in both legs of each connecting angle to transmit the entire load coming on the connection to the supporting beam, girder or column; or a seat sufficiently strong to carry the full load or a side angle to hold the mean in place may be used.

SECTION 55. **Steel Trusses.** 1. Trusses shall be so designed that the stresses in each member can be calculated.

2. All trusses shall be held rigidly in position by efficient systems of lateral and sway bracing, struts being spaced so that the maximum limit of length to least radius of gyration, established in this Code is not exceeded.

3. For tension members the actual net area only, after deducting rivet holes one-eighth inch larger than the rivets, shall be considered as resisting the stress.

4. Compression members in pin-connected trusses shall be so designed that the stresses shall not exceed seventy-five per cent of the permissible working stress for columns. The heads of all eye-bars shall be made by upsetting or forging. No weld shall be allowed in the body of the bar. Steel eye-bars shall be annealed. Bars shall be straight before boring.

5. All pin-holes shall be bored true and at right angles to the axis of the members, and must fit the pin within one-thirty-second of an inch. Eye and screw ends shall be so proportioned that upon test to destruction, fracture will take place in the body of the member. All pins shall be accurately turned.

SECTION 56. **Riveting And Bolting.** 1. All component parts of built up columns, girders, and trusses shall be riveted. All column connections in buildings over four stories in height shall be riveted. Riveting shall also be used in column splices, in web and flange splices of girders and trusses, and in all connections of beams and girders to columns.

2. Where riveting is impractical, turned bolts may be used provided the holes for same are punched and reamed to a template and the bolts are accurately fitted.

3. All shop rivets, wherever practicable, shall be machine driven. The pitch of rivets shall never be less than three diameters of the rivet, nor more than six inches. In the direction of the stress it shall not exceed sixteen times the least thickness of the outside member. At right angles to the stress it shall not exceed thirty-two times the least thickness of the outside member.

4. Rivets shall fill the holes completely; the heads shall be hemispherical and concentric with the axis of the rivet; the length between heads, shall not exceed five times the diameter.

5. Where riveting is not required, connections may be made by bolts which shall be of wrought iron or mild steel with United States Standard threads. The threads shall be full and clean; the nut shall be truly concentric with the bolt; and the thread shall be of sufficient length to allow the nut to be screwed up tightly.

6. When bolts are used in tension, the working stresses shall be reduced to 7000 pounds per square inch of net area for steel, and to 5000 pounds per square inch for wrought iron, and the load shall be transmitted into the head or nut by washers distributing the pressure evenly over the entire surface of the same.

7. In the construction of exterior stairs, landings, platforms and balconies, no rivet shall be less than three-eighths inch diameter, and no bolt less than one-half inch diameter.

SECTION 57. **Protection of Structural Metal Against Corrosion.** 1. All metal structural work shall be cleaned of all scale, dirt, and rust, and be given one coat of paint at the shop completely covering all exposed surfaces. After erection all such work shall be painted at least one additional coat of a shade different from the first coat. The first coat of paint shall be made of pigments which shall be chemically inert after application, and shall be mixed with linseed or other drying oil. The amount of volatile matter shall be sufficient for easy spreading, and shall not injure the film of the paint. The paint must dry sufficiently hard within twenty-four hours so that it will not rub off or abrade easily. When the steel reaches the job, all abraded or injured portions must be thoroughly recoated with the same material as the shop coat before the second coat is applied. The second coat of paint shall be such as will not act as a solvent of the first coat, and shall be mixed with a pigment which shall be inert after application, and the vehicle shall be one that will not saponify under the action of cement mortar.

2. Surfaces of riveted work which come in contact with each other, shall be painted with two coats of paint before assembling.

3. All iron or steel used in damp locations or under water shall be embedded in Portland cement concrete. No paint shall be applied to the steel surfaces which are to be encased in concrete.

4. Any structural steel work which may be so placed as to be inaccessible for inspection after erection, shall be thoroughly cleaned of all rust and encased in Portland cement before it is rendered inaccessible.

PART XI

ROOFS, ROOF STRUCTURES AND FIRE DOORS

SECTION 58. **Roof Coverings.** 1. All buildings except as given below shall have roof coverings of approved standard quality, such as brick, concrete, tile or slate; or highest grade of tin roofing or of asbestos shingles, or of roof built-up roofing felt with sand, gravel or slag surface, or of built-up asbestos roofing; or other roofing of like grade which would rank as Class A. or B. under the test specified on the National Board of Fire Underwriters.

Exceptions:

(a) Dwellings.
(b) Frame Buildings.
(c) Buildings not exceeding two stories or thirty feet in height and 2500 square feet in area, and not used for factories, warehouses, or mercantile purposes.

2. The quality of roofing for all dwellings and other buildings exempted in paragraph one, shall be as herein specified; or may be of a grade not lower than that indicated in the definition of approved fire-re-

sisting roofing, Section fifteen, paragraph three; or of a grade which would rank not lower than Class F, under the test specifications of the National Board of Fire Underwriters. Outside of Fire limits, dwellings, tenement houses and apartments may have shingle roofs.

3. A layer of deadening felt at least one-sixteenth inch thick shall be placed between metal roofing and the supporting woodwork.

4. The wooden planking and sheathing of roofs shall not in any case be extended across side or party walls.

5. All flashings shall be of metal properly incorporated with the roofing material. Flushing equal to the roofing material used, or approved composition.

6. The top and sides of dormer windows shall be protected the same as the roof.

7. This section shall not be construed to prohibit the repairing of a wooden shingle roof, provided the building is not increased in height, but the renewal of such a roof is forbidden. No existing wooden shingle roof, if damaged more than twenty-five per cent shall be repaired with other than approved roofing.

SECTION 59. **Roof Leaders.** All buildings shall be provided with proper metal leaders, which shall be connected to the sewer. Where there are no sewers such leaders shall be connected by pipes below the surface to the street gutter or cesspool. Detached dwellings, or other one story buildings, may be exempt from the requirements of this section at the discretion of the Building Inspector.

SECTION 60. **Scuttles On Roofs.** Upon the roof of every building more than 15 feet high, there shall be a scuttle with stairs or substantial stationary step ladder leading to same, which shall be easily accessible at all times to all occupants without the use of keys. All non-fireproof scuttles shall be covered on the top and edges with sheet metal or other approved fireproof material. The roof opening shall be at least 2 feet by 3 feet in size.

SECTION 61. **Pent Houses And Bulkheads.** 1. All inclosures upon roofs for tanks, elevators or elevator machinery, and all pent houses, bulkheads, monitors or other wall inclosures above the roof upon non-fireproof buildings shall be of fireproof construction, or may be built of wooden studs filled with brick or other incombustible material, all covered with sheet metal, or metal lath and cement plaster or other weather resisting, fire proof material not less than one-fourth inch in thickness; and all windows, doors, and trim shall be of metal, or metal covered, and be glazed with wired glass where glass is used; provided that structures built in this manner shall not have a vertical height of over 8 feet above the roof through which they pass.

2. All such structures upon fireproof buildings shall be of fireproof construction, including floors, and in all cases the outside surface shall be covered with approved incombustible weatherproof material, including all surfaces and the edges of doors and jambs.

3. Bulkheads or pent houses when used only for the purpose of enclosing staircases to roofs, elevator machinery, water tanks, ventilating apparatus, exhaust chambers, or other machinery, need not be considered in determining the height of the building.

Pent houses when occupied for purposes other than hereinbefore described, shall not exceed 12 feet in height, and shall not occupy more than 75 per cent of the area of the roof, including all other bulkheads or pent houses.

4. No staging, stand, sign, or other structure shall be constructed upon the roof of any building without first obtaining the approval of the Building Inspector.

SECTION 62. **Tanks.** 1. Tanks of more than 500 gallons capacity placed within any building, or on or above the roof of any building, shall be supported by steel or masonry of sufficient strength to carry the same safely. Beams shall rest at both ends on steel girders, iron or steel columns, or walls or piers of masonry.

The supporting beams shall either have the ends built into masonry work, or shall be securely framed together in a manner to prevent possibility of overturning or buckling due to oscillation of the tank in a wind storm.

2. In or near the bottom of each tank there shall be a pipe or outlet not less than 4 inches in diameter, fitted with a suitable gate valve, to permit ready drainage of the tank in case of necessity.

3. Wooden covers of tanks on roofs shall be covered with metal. Hoops of wooden tanks shall be of metal round in section.

4. Tanks having a capacity exceeding 1000 gallons and placed on or within non-fireproof buildings, shall have the supporting steel framework thoroughly encased in fireproofing material.

SECTION 63. **Cornices And Gutters.** 1. On all buildings within the fire limits the exterior cornices, inclusive of those on show windows and gutters, shall be of incombustible material. All cornices not built as a part of the walls, shall be secured to the walls with metal framing or anchor.

2. Exterior wooden cornices or gutters on buildings or structures within the fire limits, which are unsafe or are damaged to the extend of one-half, shall be taken down; any replacement of same shall be made with incombustible materials. If damaged less than one-half, they may be repaired with the same material as originally constructed.

3. Outside of the fire limits where buildings having masonry walls are placed nearer than 3 feet to a side or rear lot line, or 5 feet to another building, the cornices and overhanging eaves on the side or rear walls shall be of, or covered with, incombustible material. When such buildings are erected in rows, combustible cornices on the front shall be fire-stopped with incombustible material between each building.

SECTION 64. **Skylights.** 1. All skylights shall have metal frames and sash, and the frames and parts thereof shall be riveted or otherwise securely fastened in addition to soldering.

2. Except as herein provided, all skylights shall be glazed with wired glass.

3. No wired glass shall be placed in a skylight at the top of enclosures for elevators, stairways, dumbwaiters or vent and light shafts; all such skylights shall be glazed with thin glass and shall be protected by galvanized wire screens. The mesh of such screens shall not exceed 1 inch, and the wire shall be of a size not less than No. 12 guage. All screens shall have substantial metal supports and shall be placed at least 6 inches above skylights and project 6 inches beyond edges of skylights.

4. When metal louvres are used for ventilating purposes, over shafts or in connection with skylights, the louvres or slats shall be riveted to the metal frame.

5. Instead of a skylight over a shaft, a window of equivalent area may be placed in the side of the

shaft above the roof, which is furthest removed from a property line. The window shall have incombustible frame and sash, and be glazed with thin glass.

6. Except windows in the side of shafts above the roof, wired glass only shall be used in skylights which are vertical or inclined at an angle of over 45 degrees, when subject to an exposure which would require wall openings to be protected by fire windows or fire doors.

Protection Of Skylights And Roof. 1. Where walls are carried up above the roofs of adjoining buildings, proper means shall be provided and used by the person erecting the walls for the protection of the skylights and roofs of such adjoining buildings.

2. Should owner of such adjoining building refuse permission to have his roofs and skylights protected, such refusal shall be reported in writing to the Building Inspector, and it shall then be the duty of the owner refusing such permission to make his skylights and roofs safe at his own expense. Such refusal by said owner shall relieve the owner or person erecting the building from any responsibility for damage done to persons or property on or within the premises affected.

SECTION 65. **Fire Doors, Fire Windows and Fire Shutters. Protection of Exterior Wall Openings.** 1. Every building within the inner fire limits, except churches and dwellings, shall have approved fire doors, or fire windows on every exterior opening above the first story, when fronting on a street or driveway less than 50 feet wide, or where another building or portion of the same building is within 50 feet of such opening; also all openings in the side and rear walls of the first story, except show windows, when less than 50 feet from another building. The walls of a building in the same plane or parallel planes and facing in the same direction as that in which the opening is situated, shall not be considered as coming within the intent of this rule.

2. Approved fire shutters may be substituted in place of the fire windows required in paragraph 1. In such cases at least one row in every three vertical rows of shutters shall be arranged to be readily opened from the outside, and a distinguishing mark satisfactory to the chief of the Fire Department shall be provided on these shutters.

3. Occupants of buildings shall close all fire

doors, shutters, and windows at the close of business each day.

SECTION 66. **Protection Of Interior Wall Openings.** 1. All openings in interior walls shall be protected by fire doors and fire windows where required by this Code, and wherever considered necessary by the Building Inspector.

2. In buildings of all classes, all openings into halls or adjoining rooms from rooms in which paints, oils, varnishes, spirituous liquors, or drugs or other highly inflammable liquids or materials are stored for purpose of sale or otherwise; or in which manufacturing processes, or business operations are conducted which are generally recognized as hazardous as regards fire, shall be protected by self-closing fire doors, or fire windows.

This paragraph shall apply to existing as well as new buildings.

PART XII

PROTECTION OF VERTICAL OPENINGS

SECTION 67. **Enclosures For Stairways, Elevators, Escalators And Other Shafts In Fireproof Buildings.** 1. All interior shafts containing stairways required to be enclosed by Section 95, and except in dwellings, all shafts exceeding 6 square feet in area containing elevators, escalators, hoistways, chutes, ventilating ducts, or used for any other purpose, shall be continuously enclosed with fireproof walls or partitions built as follows:

(a) Brick or plain solid concrete not less than 8 inches in thickness for the uppermost 30 feet, increasing 4 inches in thickness for each lower section of 30 feet or part thereof; or 8 inches in thickness for the entire height when wholly supported at vertical intervals not exceeding 30 feet.

(b) Reinforced stone or gravel concrete not less than 6 inches in thickness for the uppermost 30 feet, increasing 2 inches in thickness for each lower section of 30 feet; increasing 5 inches in thickness for the entire height when supported at vertical intervals not exceeding 20 feet and braced where necessary with lateral supports or suitable steel uprights.

(c) Semi-porous or porous terra cotta tile, or solid gypsum blocks not less than 6 inches in thickness for the entire height when supported at vertical intervals not exceeding 20 feet, and securely anchored by steel reinforcement encased in the construction.

Terra cotta tile shall have not less than two cells in its thickness, with shells and webs not less than five-eighths inch thick.

All openings in such partitions shall have substantial steel framing, the vertical members of which shall be securely attached to the floor construction above and below.

(d) Any material and form of construction which may be approved by the Building Inspector after a fire and water test as required in Section 174 National Code, but no such partition shall be less than 5 inches thick.

2. Enclosure partitions supporting floor loads shall be of materials and thickness required for bearing walls.

3. Portland cement mortar shall be used for all masonry work in shaft construction, except that gypsum mortar may be used to set gypsum blocks.

4. Concrete walls or partitions shall conform to the requirements of the sections on concrete construction.

5. The bottom of such enclosure, and the top when not extended through the roof, shall be of fireproof material not less than 4 inches in thickness.

6. When such shafts extend to the top story, they shall continue through the roof, and shall project not less than 6 inches above the roof surface. All such shafts shall be enclosed above the roof by at least 5 inches of brick, or stone concrete.

7. Every shaft which extends above the roof shall have a skylight, covering at least three-fourths of the area of the shaft.

8. All steel used to support shaft enclosures, as required in this section, shall so far as possible, be embedded in the fire-proofing material, and shall be protected on all sides, in the manner required for steel in fireproof buildings.

9. When the compartment that contains the machinery for operating an elevator communicates with an elevator shaft, it shall be enclosed with fireproof partitions as required for the shaft.

10. A shaft shall not contain more than three elevators. The separating partitions shall be not less than 2 inches thick.

11. A stairway and elevator shall not be permitted within the same shaft enclosure.

12. All door openings into such shafts shall be protected by fire doors and shall be self-closing except for elevator doors. No glass shall be permitted in such doors, except when doors in elevator shafts open upon an enclosed hallway a wired glass panel not exceeding four square feet may be provided in each door. Care shall be exercised to insure that all such doors shall fit the opening as closely as practicable.

In factories and warehouses where elevator shafts open directly into a work or storage room, no wired glass shall be permitted in the doors. The size of such door openings shall not exceed 5 feet 4 inches by 7 feet 6 inches.

13. Windows shall not be permitted in shaft enclosures, except those opening to the outside air, and which are at least 3 feet distant from any other opening; all such windows shall be stationary or automatic closing fire windows.

14. Where an elevator, escalator, or stairway as required in paragraph 1, connects two floors only in a building, it shall be enclosed in the same manner as for a continuous shaft, except that it may be left open in one story if enclosed in another. Such elevator or escalator shall not be included in calculations for required means of exit, and no such stairway shall be considered as an exit from more than one floor.

15. Freight elevators in warehouses or garages not over two stories in height need not be enclosed, but pent houses over elevators in such buildings shall not be allowed unless lined with incombustible material.

SECTION 68. **Enclosures For Dumbwaiters And Other Shafts Not Exceeding 6 Square Feet in Area In Class A & A-B Buildings.** 1. All dumbwaiter and other shafts or chutes not exceeding 6 square feet in area, excepting dumbwaiter shafts which do not extend more than one story above the cellar or basement floor in dwellings, shall be continuously enclosed by partitions of brick, terra cotta, concrete, metal lath and cement plaster, gypsum blocks, or other approved fireproof material not less than 3 inches thick, which may meet the test specified in Section 174 National Code. Such walls or partitions shall rest upon incombustible foundations, and shall be braced between floors with approved incombustible framing. Gypsum blocks may be set in gypsum mortar; all other blocks shall be set in Portland cement mortar.

2. When dumbwaiter or other small shafts are constructed of blocks or tile, all corner blocks or tile shall be held by metal angle clips or anchors, or be secured by other approved means.

3. Where a dumbwater shaft extends into the cellar or basement of a building, it shall be enclosed in that story with walls of masonry not less than 5 inches thick.

4. The bottom of such shaft shall be of fireproof material and where such shaft does not extend through the roof, the top of the shaft shall be of fireproof material of at least the thickness of the enclosing partitions.

5. When such a shaft penetrates the roof it shall project at least 6 inches above the roof, and shall be covered with fireproof material and have a skylight covering at least three-fourths the area of the shaft.

6. All openings in dumbwaiter shafts shall be provided with approved self-closing fire doors.

7. No woodwork other than the guides and car shall be permitted in the construction of any such shaft.

Section 69. Light and Vent Shafts.

1. The walls of all light or vent shafts, whether exterior or interior, shall extend not less than 3 feet above the level of the roof and be coped.

2. In all buildings other than private dwellings and frame buildings, all windows opening into light and vent shafts shall be protected by fire windows.

Section 70. Enclosures for Elevator and other Shafts in Class Mill, B. and C. Buildings.

1. In non-fireproof buildings of ordinary construction, all shafts defined in Sections 67, 68, 69, shall be constructed as specified in those sections, except as herein provided, and except that the enclosing walls or partitions may be of semi-porous two-cell terra cotta, or of solid gypsum blocks, not less than 5 inches in thickness; or 4 inches of reinforced concrete. The thickness of material permitted under test as specified in section 67, shall be not less than 4 inches. Such partitions shall be supported by steel

structural framework at intervals not exceeding 20 feet. In all respects the reinforcement, bracing, and protection of steelwork shall conform to the requirements of Section 67.

Any woodwork other than guides and car, exposed on the inside of the shaft, shall be covered with metal, or metal lath and three-fourth inch of cement or cement-tempered plaster, or their equivalent.

2. Dumbwaiter and other small shafts of not more than 10 sq. ft. in sectional area may be constructed of 2 inch plank, Tongue and Groove, wood to be lined with sheet metal.

3. Every shaft in a non-fireproof building that extends to the top floor shall continue through the roof and at least 3 feet above it, with walls of same thickness as required in the upper story. In all respects, shafts in non-fireproof buildings of ordinary construction, shall conform to the requirements of Sections 67 and 68.

4. When such partitions rest upon timber construction, they shall be fire-stopped with incombustible material the full depth of the floor beams at each floor level in the manner specified in Section 73. Par. 2. The fire stopping shall be placed to form a complete cut-off between the interior of the building and the shaft.

PART XIII.

MISCELLANEOUS CONSTRUCTION REQUIREMENTS

SECTION 71. **Light And Ventilation.** 1. In all buildings every sleeping room shall be provided with a window or windows opening directly upon a street, yard or court except that in dwellings a window shall not be required in a sleeping room which is lighted and ventilated by a skylight; or which is connected by an archway or opening containing not less than 50 square feet in the clear, with a room other than a sleeping room provided with at least two windows of not less than 15 square feet area each between stop beads, and opening directly on a street or yard.

The windows of every sleeping room shall have an area of not less than 12 square feet between stop beads, and the sash shall be arranged to open to the extent of one-half their area. The glass area of skylights for ventilating sleeping rooms shall be not less than 9 square feet, and the skylight shall be provided with movable ventilating louvres or sash.

2. In every building, other than a detached

dwelling and a dwelling occupied by not more than one family, every sleeping room shall be, for at least two-thirds of its area, not less than 8 feet 6 inches high from the finished floor to the finished ceiling, and shall be not less than 7 feet in width at its narrowest point, and have an area of not less than 70 square feet, except that in hotels, the area shall be not less than 80 square feet.

3. No sleeping room shall be placed in any story the ceiling of which is less than 4 feet 6 inches above the curb or adjacent ground level.

4. Light and ventilation of sleeping rooms in tenement houses shall be as required in Section 290 293 National Code.

SECTION 72. **Floor Lights.** Floor lights shall have metal or reinforced concrete frames, and shall be of the same strength as the floors in which they are placed. The glass in floor lights shall be not less than three-fourths inch in thickness, and if any glass measures more than 16 square inches, there shall be a wire mesh, either in the glass or under it.

SECTION 73. **Fire-Stopping.** 1.Furred Walls For all walls furred with wood, the masonry between the ends of wooden beams shall project the thickness of the furring beyond the inner face of the wall for the full depth of the beams; or a course of masonry above and below the beams shall project the full thickness of the furring beyond the face of the wall. In cases where beams (floor beams) are parallel to a wall furred with wood, there shall be a space of not less than 2 and one-half inches between such wall and the nearest beam. This space shall be filled in solidly with brickwork, or concrete for the full depth of the floor beams.

2. Studded-off spaces. Where the walls are studded-off, the space between the inside face of the wall and the studding at the floor level shall be fire-stopped with brickwork or other approved fireproof material. The beams directly over the studded-off space shall be deadened with not less than 6 inches of fireproof material, which shall be laid on boards cut in between the beams. The under side of such beams shall be protected by a covering of metal lath, or plaster board, and plastered to a total thickness of three-fourths inch.

3. **Partitions.** Where stud partitions rest directly over each other, and cross the wooden floor beams

at any angle, they shall run down between the floor beams and rest on the top plate of the partition below, and shall have the studding filled in solid between the uprights, the depth of the floor beams and at least 4 inches above each floor level with brickwork or other approved incombustible materials. Such stops shall be arranged to entirely separate the spaces between floor beams and those between partition studs in a manner to effectually cut off draft openings from story to story.

When sliding doors are pocketed in partitions, care shall be exercised to insure that such pockets be completely fire-stopped at top and bottom.

4. Wainscoting. The surface of the walls or partitions behind wainscoting shall be plastered flush with the grounds and down to the floor line.

Stair. The space between stair carriages shall be fire-stopped at least once in the middle portion of each run.

6. No fire-stops shall be covered or in any manner concealed from view until approved in writing by the Building Inspector, who shall inspect the same within 48 hours after receiving written notice. Sundays and legal holidays excepted.

7. Pipes, shafts and belts. All exposed pipes or power shafting passing through any floor or wall shail have the surrounding air space closed off at the ceiling and the floor line; also on each side of the wall by close fitting meal caps. In fireproof construction it is preferable to have the pipes or shafts fit neat in the floor or wall.

All belt drives through floors shall be continuously enclosed by steel framework covered with metal latn and cement plaster, or other approved incombustible material. Where possible all such belts shall be placed in a special shaft as required in Mill Construction, Section 109, National Code.

8. Ducts and Chases. Ducts, chases, or shafts for pipes, wires cables, and for similar purposes, shall be constructed as required in Section 67 and 75 or shall be fire-stopped at each floor.

SECTION 74. **Requirements In Non-Fireproof Buildings Used For Business And Residence.** All ordinary construction non-fireproof buildings of Classes C and D over two stories or 35 feet high, where the lower stories or portions thereof are used for business, and the stories above for residence purposes, shall have all partitions and ceilings separating the business portions from the residence portions, covered with metal lath or three-eighths inch fibre plaster board and plastered with cement or cement-tempered plaster to a total thickness of three-fourths inch; or plaster-board may be covered with sheet metal. Other equivalent fireproofing may be used. There shall be no windows in such partitions, and all other openings shall be protected by firedoors.

Stairways, elevator and other shafts in such buildings, shall be constructed in conformity with requirements of Section 70.

Fire-stops shall also be provided at the line of the ceilings to completely cut off all communication to floors above through hollow stud partitions or side walls, as required by Section 73.

SECTION 75. **Rat Proofing.**—All openings in outside walls and basement floors shall be securely screened with No. 18 Galvanized wire screens with one-half inch mesh and all openings in basement walls or floors for the passage of sewer water, gas conducts or other piping shall be entirely filled with concrete or other masonry to prevent the entrance of rodents.

CELLARS, VAULTS, AREAWAYS AND PROJECTING STRUCTURES

SECTION 76. **Requirements For Cellars.** 1. Drainage. Before the walls of buildings are carried above the first tier of beams, the cellar shall be connected with the sewer and provided with a properly screened intake. Should there be no sewer in the street, or if the cellar is below water or sewer level, provision shall be made to prevent water accumulating in the cellar, to the injury of the foundation.

2. Floors. Any floor laid on the ground shall be made of concrete not less than 4 inches thick. Such floors and the exterior walls shall be waterproofed when required by the Building Inspector.

3. Shafts. Stairways and other shafts which communicate with cellars, shall be enclosed as specified for such shafts in Sec. 67 to 69 inclusive.

SECTION 77. **Vaults Under Sidewalk.** 1. Where a vault is built under the sidewalk a wall shall be constructed to retain the adjacent banks.

2. The roofs of all vaults shall be of approved incombustible material. Glass, when used in the roofs of the vaults, shall measure not more than 16 square inches in one light.

3. All vaults shall be thoroughly ventilated.

SECTION 78. **Areaways And Projections Beyond The Building Line.** 1. Areaways or openings covered with iron gratings or with iron doors not more than 3 feet in width, with rough surface set flush with sidewalk, may project not more than 4 feet beyond the building line. If gratings be used, they shall have a wire screen of not more than one-half inch mesh securely attached to the under side.

2. No open areaways, railing, steps, or any portion of a building or structure shall project beyond the building line at any point less than 10 feet above the curb level.

3. Water tables, belt courses, sills, bases, columns, pilasters, capitals or other decorative features which are part of the construction shall not project more than 6 inches beyond the building line. Such projection may be erected only upon a revokable permit issued by the Building Inspector when in his opinion such projection will not in any manner obstruct the free use of the sidewalk for travel.

4. No bay, oriel or show window shall project beyond the building line at any point. When erected within the fire limits they shall be constructed of incombustible material, except that on a dwelling such window may be permitted of wooden framework covered with incombustible material, provided it does not extend more than 3 feet above the second-story floor. Cornices of show windows more than 10 feet above curb level may project not more than 18 inches beyond building line.

5. Alterations or repairs to areaways, steps, store fronts, or projecting or show windows shall be subject to the requirements of this section.

SECTION 79. **Use Of Sidewalk Or Street Space Prohibited.** 1. Projections of base course and entrances. The face of the base course of any building shall not project more than four (4) inches beyond the street line. Pilasters emphasizing an entrance shall not project more than six (6) inches and the face of all other pilasters and quoins shall not project beyond the street line more than two (2) inches beyond the street line. Not more than one (1) step may project over the street line not to exceed six (6) inches.

2. Projections of show windows and doors. No part of any show window, store front or show case, except the sill, shall project beyond the street line

and such sill shall not project more than four (4) inches. Doors inside of the Fire Limits, either of the revolving or swinging type, in any position, shall not project over the street line more than one (1) foot. Doors out of the Fire limits which swing over the street line shall be maintained normally closed. Alteration work in connection with store fronts shall be performed in accordance with the requirements of this section.

3. Minimum height or projections above grade. All projections beyond the street line, except those covered in paragraphs 1 and 2, shall be at least eight (8) feet in the clear above the highest point of the sidewalk and the lowest projection of any projection. If, however, such projection should extend to within two (2) feet of the curb line, the height above the sidewalk shall be increased to twelve (12) feet measured in a similar manner. No projection shall extend beyond the curb line. The provisions of this section shall apply not only to fixed projections but also to movable projections such as awnings, etc., but shall not prohibit the operation of balanced stairs. All balanced stairs projecting over the sidewalk shall be kept normally in an upward position, the stair and its supports shall be regulated as an ordinary projection.

4. Limit of projections. Projections which are more than eight (8) feet in height above the grade shall not project beyond the lot line more than the values given in the following table, using the minimum value given:

Bay Windows	4	per cent of Street width or 3 feet
Oriel Window	4	per cent of Street width or 3 feet
Balcony	5	per cent of Street width or 3 feet
Main Cornices	5	per cent of Street width or 4 feet
Subordinate Cornices	2½	per cent of Street width or 2 feet
Belt Courses	2½	per cent of Street width or 2 feet
String Courses	2½	per cent of Street width of 2 feet
Fire Escape Balconies		4 feet

Where a building is constructed on a corner fronting on two (2) streets of different widths, the projection shall be limited by the width of the street upon which it fronts. The limit of projection for marquises or fixed awnings is given in Paragraph 5. The limit of projection for movable awnings is given in Paragraph 3.

5. Marquises or fixed awnings. A fixed awning

or marquise projecting over the sidewalk shall conform to the following regulations:

(a) Metal and wire glass only shall be used in construction.

(b) The marquise shall be supported entirely from the building.

(c) The construction shall be calculated for a live load not less than twenty (20) pounds per square foot.

(d) For limit of heights above grade and projection over sidewalk, see Section.........

(e) The vertical height of the front or sides of a marquise shall not exceed twenty-four (24) inches at any point.

(f) The length of the marquise, when attached to a building over two (2) stories in height, shall not exceed forty (40) per cent of the total street frontage of the building and the entire length on any street shall not exceed seventy-five (75) per cent of such street frontage. The marquise shall be so located as not to interfere with the operation of exterior standpipes or fire escapes. The Chief of the Fire Department shall approve the location of the marquises of all buildings exceeding two (2) stories in height.

(g) Not less than seventy-five (75) per cent of roof area of marquise shall be of wire glass.

(h) Water from marquises shall be conducted by downspouts to the sewer or under the sidewalk to the curb.

6. Movable awnings. Movable awnings shall be limited in their heights above the grade and projection over sidewalk as covered in Paragraph 3. Movable awnings shall be constructed with metal frames and shall be supported entirely by the building.

7. Fences along sidewalk. When there is any depression exceeding six (6) inches in depth along a sidewalk, the owners of the abutting property shall furnish and install a substantial railing not less than forty-two (42) inches high to prevent passersby from falling therein. Such railing shall be made permanent or temporary as the occasion demands. When such railing is to be permanent and located in the Fire Limits, it shall be constructed of incombustible material.

PART XIV

WALLS

SECTION 80. **Brick Walls And Walls In General.**

Section 80

1. Every building other than frame buildings shall be enclosed on all sides with independent or party walls of incombustible materials. This shall not preclude the construction of any story supported on piers entirely open to the outer air, provided that in all such buildings the floor and the ceiling of such open story shall be protected by incombustible material.

2. The masonry walls and piers of every building shall be properly and solidly bonded with mortar joints They shall be built to a line and carried up plumb and straight.

3. All brick shall be thoroughly wet just previous to being laid, except in freezing weather, when they shall be thoroughly dry. No masonry work of any description shall be built when the temperature is below 28 degrees Fahrenheit on a rising temperature or 32 degrees on a falling temperature at the point where the work is in progress. No frozen materials shall be built upon, but shall be removed.

4. No wall of any building or structure shall be built more than two stories in advance of any other portions of the walls of the building or structure. This provision need not apply to buildings where walls are carried independently by girders at each floor. All walls shall be securely anchored and bonded at points where they intersect. Where such walls are not built at the same time, the perpendicular joint shall be regularly toothed with 4-inch offsets, and the joint shall be provided with anchors not less than 2-inch by three-eighths inch metal, with bent-up ends or cross pins to form anchorage; such anchors are to be not less than 3 feet long, extending 18 inches on each side of the joint and spaced not more than 3 feet apart in height.

5. The walls and beams of every building during erection or alteration shall be securely braced wherever required until the building is enclosed.

6. In brick walls every sixth course shall be a heading course, except where walls are faced with brick in Flemish bond, in which case the headers of every third course shall be full brick and bonded into the backing. Where running bond is used, it shall be bonded into the backing by cutting the corners of every brick of every sixth course of the face brick and putting in a row of diagonal headers behind the same; suitable metal anchors shall also be used in the bonding course at intervals not exceeding 3 feet. Where face brick is used of a different thickness from the

brick used for backing, the courses of the exterior and interior brickwork shall be brought to a level bed at intervals of not more than eight courses in height of the face brick, and the face brick shall be properly tied to the backing by a full heading course of the face brick or other approved method.

7. Face brick shall be laid at the same time as the backing, and in no case be laid after the backing is in place.

8. When walls of hollow blocks are veneered as permitted in Section 90, Paragraphs 4 and 5, the facing shall either be bonded to the backing with a row of headers every 16 inches, or be attached to the backing with approved metal wall ties bedded in the mortar joints. Such ties shall not be spaced further apart on centers than one foot vertically and 2 feet horizontally. Such veneering shall not be considered a part of the required thickness of the wall. Brick facing or veneering may, however, be considered as part of a hollow terra cotta or concrete wall (or vice versa), provided the veneering is bonded at least 4 inches into the wall at intervals not exceeding six courses of brick. When veneering is used special care shall be taken to fill all joints flush with mortar around wall openings.

SECTION 81. **Piers.** 1. Every pier shall be built of squared stone, stone concrete, or approved brick. Stone or brick piers shall be laid in Portland cement mortar. Every exterior pier shall be secured anchored to the beams or girders at the level of each tier.

The height of any isolated pier shall not be greater than ten times its least horizontal dimension. Except in frame buildings, no masonry pier shall be less than 16 inches square.

2. Interior piers shall not be built of stone, neither shall stone bonds or caps be used in such piers, except in frame buildings.

3. Every exterior stone or brick pier less than 6 square feet in cross-section, which supports a beam, girder, arch or column upon which a wall rests, or a lintel spanning an opening over (10) ten feet wide on which a wall rests, shall have built into it, at vertical intervals of not more than 30 inches, approved bond stones, steel, or cast iron plates. Bond plates shall be full size of the pier.

4. Steel bond plates shall be not less than one-fourth inch in thickness and shall be perforated by

three holes per square foot of area; the diameter of the holes shall be not less than three-fourths inch.

5. Monolithic stone posts shall not be used for the support of columns, girders or walls.

SECTION 82. **Stone Walls.** 1. Every stone wall shall have one header extending through the wall in every 2 feet in height and every 3 feet in length. Headers shall be staggered. All headrs shall be good, flat stones, not less than 12 inches wide and 8 inches thick.

2. All stones shall be laid on their natural bed. No stone which does not bond into the wall at least 6 inches shall be used. Stones shall be firmly bedded in mortar with all spaces and joints thoroughly filled.

3. Walls built of squared stone, with dressed level beds, shall have a thickness not less than that required for brick walls under similar conditions.

4. Walls built of rubble stone shall have such increase of thickness over that specified for squared stone walls as may be required by the Building Inspector. Rubble stone walls shall not exceed three stories or 40 feet in height.

SECTION 83. **Ashlar.** 1. Stone or architectural terra cotta ashlar, or other approved material used for the facing of any building or structure, shall be not less than 4 inches thick. In stone ashlar, each stone shall have a reasonably uniform thickness, but all stones need not necessarily be the same thickness. Each block of ashlar or other approved facing, shall either be bonded into the backing, or be securely anchored to the backing with metallic anchors, at least one for each 30 inches lineal length of course, and the backing independent of facing, shall conform to the wall thickness required by this Code. Where every alternate course of facing is at least 8 inches thick and bonded into the backing, at least 4 inches, the ashlar may be counted as part of the thickness of the wall. No wall faced with ashlar shall be less than 12 inches thick.

2. Buildings of reinforced concrete construction may have approved facing material less than 4 inches thick, provided such facing is safely and securely anchored to the wall in a manner acceptable to the Building Inspector, but no such facing shall be considered as a part of the thickness of the wall.

SECTION 84. **Mortar For Walls.** Foundations, footings and parapet walls shall be laid in Portland cement mortar, also arches over doorways and windows. All chimneys shall be laid in Portland cement mortar to which no lime has been added. Other brick walls may be laid in lime, lime and cement, or cement mortar. Hollow block walls shall be laid in Portland cement mortar.

SECTION 85. **Brick Wall Thicknesses.** 1. All bearing walls shall be of sufficient thickness to support the load to be carried without exceeding the stresses specified in Section 47, but in no case shall such walls be less than 12 inches thick, unless built of concrete or reinforced concrete. Concrete walls may be 2 inches less in thickness than herein specified for brick walls.

(Thickness of Reinforced Walls, Sec. 149.)

2. The minimum thickness of all brick bearing walls shall be in accordance with the following schedules and tables. In determining the thickness of walls for varying heights, they shall be measured to the nearest tier of beams or support, whether this be a foundation, a beam, or a girder.

(Thickness of Foundation walls Section 41, Paragraph 2, 3.)

(Thickness of non-bearing walls, Section 88.)

3. Walls for Dwelling House Class. The expression "walls for dwelling house class" shall be taken to mean and include walls for all buildings specified under Classes C and D, Section 32, as well as all other buildings used for temporary or permanent residence.

For all brick bearing walls of buildings of the Dwelling House Class, the upper three stories shall be not less than 12 inches thick, increasing 4 inches in thickness for each three stories or fraction thereof below. No three-story increment shall exceed 45 feet in height.

4. Table indicating minimum thickness of walls in accordance with above requirements:

Section 85

DWELLING HOUSE CLASS

Stories	Brick Bearing Walls 1	2	3	4	5	6	7	8	9	10
1	12	----	----	----	----	----	----	----	----	----
2	12	12	----	----	----	----	----	----	----	----
3	12	12	12	----	----	----	----	----	----	----
4	16	12	12	12	----	----	----	----	----	----
5	16	16	12	12	12	----	----	----	----	----
6	16	16	16	12	12	12	----	----	----	----
7	20	16	16	16	12	12	12	----	----	----
8	20	20	16	16	16	12	12	12	----	----
9	20	20	20	16	16	16	12	12	12	----
10	24	20	20	20	16	16	16	12	12	12

5. **Walls for Warehouse Class.** The expression "walls for warehouse class" shall be taken to mean and include walls for all buildings specified under Classes A, B, E and F, in Section 32 as well as all other buildings used for similar purposes.

Excepting party and fire walls, brick bearing walls for all buildings of this class, not exceeding five stories or 65 feet in height, shall have the upper two stories not less than 12 inches thick, increasing 4 inches in thickness for each two stories or fraction thereof below. For such building in excess of five stories, but not exceeding ten stories or 125 feet in height, the top story shall be not less than 12 inches thick, increasing 4 inches in thickness for each two stories or fraction thereof below. No two-story increment shall exceed 30 feet in height.

6. Table indicating minimum thickness of walls in accordance with the above requirements:

WAREHOUSE CLASS

Brick Bearing Walls

Stories	1	2	3	4	5	6	7	8	9	10
1	12	----	----	----	----	----	----	----	----	----
2	12	12	----	----	----	----	----	----	----	----
3	16	12	12	----	----	----	----	----	----	----
4	16	16	12	12	----	----	----	----	----	----
5	20	16	16	12	12	----	----	----	----	----
6	24	20	20	16	16	12	----	----	----	----
7	24	24	20	20	16	16	12	----	----	----
8	28	24	24	20	20	16	16	12	----	----
9	28	28	24	24	20	20	16	16	12	----
10	32	28	28	24	24	20	20	16	16	12

7. In all buildings, except dwellings, brick party walls and fire walls which serve as bearing walls on both sides, shall not be less than 16 inches thick in the

upper two stories or upper 30 feet increasing 4 inches in thickness for each two stories or fraction thereof below.

(Thickness of non-bearing fire walls, 88.)

8. The height of a wall between lateral supports shall not exceed fifteen times its thickness unless strengthened by piers or cross-walls, as the building Inspector may direct.

9. When the clear span of the floor is greater than 25 feet in buildings of Classes A, B, E, and F, and greater than 25 feet in buildings of Classes C and D, the thickness of bearing walls shall be increased 4 inches over that specified in the foregoing tables for every 12 and one-half feet or fraction thereof that the said span exceeds 25 feet for buildings of Classes A, B, D, and F, or 26 feet for classes C and D; or shall have in lieu of this increase of thickness, such piers or buttresses as the Building Inspector may direct.

10. Every bearing wall faced with brick laid in running bond shall be 4 inches thicker than specified in the foregoing tables.

11. If any horizontal section through a bearing wall shows more than 30 per cent area of flues and openings in a wall laid up in lime or lime and cement mortar, the said wall shall be increased a thickness of 4 inches for every 15 per cent or fraction thereof for which the total area of flues and openings exceed 30 per cent or 45 per cent. The total area of openings and flues in any bearing wall shall not in any case exceed 60 per cent.

12. In all buildings, walls 12 inches thick, and over 60 feet in length; and walls 16 inches thick which are over 100 feet in length, shall be 4 inches thicker throughout than is required by this Code, unless they are properly braced by cross walls, pilasters, or buttresses.

13. The thickness of non-bearing walls may be 4 inches less than that of bearing walls, provided that no non-bearing wall is less than 8 inches thick except it be of reinforced concrete.

(Partition Walls, 118—Shaft Walls, 67.)

14. In no case shall the thickness at the bottom of masonry retaining walls be less than one-quarter the height of the wall unless reinforced in an approved manner.

15. Brick or concrete walls of buildings outside the fire limits, which under this ordinance could be of

wood, may have a minimum thickness of 8 inches. Such walls shall not exceed two stories or 30 feet in height, exclusive of gables, nor shall they exceed 55 feet in length unless braced by cross walls, piers, or buttresses.

SECTION 86. **Panel Or Enclosure Walls For Skeleton Construction.** In skeleton construction the panel walls shall be supported by girders at each floor level, and if of brick, shall be not less than 8 inches thick, laid in cement mortar. When the vertical distance between supporting girders exceeds 17 feet the thickness of the wall shall be increased 4 inches for each 10 feet or fraction thereof that the said vertical distance exceeds 17 feet. Such walls shall be of brick, stone or gravel, concrete or hard burned terra cotta.

(Reinforced concrete walls, Section 149.)

(Terra Cotta in Skeleton Construction, Section 90, Par. 8.)

SECTION 87. **Curtain Walls—Class A. Buildings.** Curtain walls over three stories or 50 feet in height shall be laid in cement mortar and shall be not less than 12 inches thick for the uppermost 50 feet theref, or nearest tier of beams to that height, and increased 4 inches for every additional section of three stories or 45 feet, or nearest tier of beams to that height. When such walls are used, the foundation of the buildings shall be so designed that the load from the columns and the load from the walls are together. Curtain walls shall be anchored to the steel framing at each floor level, the anchors being spaced not further apart than 6 feet horizontally.

SECTION 88. **Fire Walls.** 1. Fire walls shall be built of brick laid in Portland cement mortar, or of reinforced concrete. In fireproof buildings, brick fire walls supported by girders at each story may be 12 inches thick throughout. In non-fireproof buildings, brick fire walls which do not serve as bearing walls shall be not less than 16 inches thick in the upper four stories or upper 50 feet, increasing 4 inches in thickness for each two stories or fraction thereof below. No such two story increment shall exceed 30 feet in height. In frame buildings used for manufacturing or commercial purposes, and not exceeding two stories or 30 feet in height, non-bearing fire walls shall be not less than 12 inches thick.

2. Every opening in a fire wall or a party wall, shall be protected on each side of the wall by an approved automatic fire door. No opening in any such wall

shall exceed 80 square feet in area, except that by written permission of the Building Inspector, a larger opening may be had upon the ground floor only; but special precautions shall be taken to protect such opening, and in no case shall the total width of openings in any one story, other than the first story, exceed 25 per cent in linear length of the wall. Fire and party walls shall be continuous from foundation to 3 feet above roof level and be coped, except that such walls in fireproof buildings need not extend above the top of the roof beams.

3. When three or more buildings used for stores, factories, or warehouses, communicate by openings through separating fire walls, the openings shall be protected by double fire doors, and each building shall also be provided with a system of approved automatic sprinklers.

4. If an opening in a fire wall is made to serve as an emergency or horizontal exit, and is included in the calculations for exits, it shall not exceed 48 square feet in area, and a self-closing fire door shall be substituted for one of the automatic fire doors. The automatic door shall be controlled by an approved automatic door release on each side of the wall.

SECTION 89. **Parapet Walls.** All exterior or party walls over 20 feet high, except where such walls are finished cornices, gutters, or crown mouldings, excepting also the walls of the detached dwellings with peaked or hipped roofs, shall be furnished with parapets. Parapet walls shall project at least 12 inches above the roof at all points. All parapet walls shall be coped with approved durable material.

SECTION 90. **Hollow Building Block Walls.** 1. Hollow building blocks of hard burned terra cotta or of concrete, may be used for all walls, except party and fire walls, of buildings not exceeding three stories or 40 feet in height, provided that such blocks have met the test requirements of Section 45, and are not stressed beond the safe limits therein prescribed. The minimum thickness of such walls shall be as required for brick walls.

2. Concrete blocks shall not be used in construction until they have attained an age of 28 days, nor until they have developed the required test strength. All building blocks shall be laid in Portland cement mortar.

3. If a wall be built of blocks laid with the cells horizontal which were designed to be normally laid with

the cells vertical, or if band courses of such blocks with cells horizontal be laid in a wall otherwise built of the same blocks with the cells vertical, the carrying capacity of such walls shall be calculated from the strength of the blocks tested with their cells horizontal.

4. Hollow terra cotta blocks in exterior walls shall be either extra hard burned or be veneered with brick, architectural terra cotta, or stone, securely bonded and set as provided in Section 80, or blocks shall be covered on the exposed surface with at least three-fourths inch of Portland cement stucco; such blocks shall be well scored, grooved or roughened to retain the coating. The stucco shall not be considered as a part of the required thickness of the wall.

5. When hollow block walls, laid with cells vertical, are decreased in thickness, the blocks in the top course of the thicker wall shall be filled solidly with concrete, or the exposed openings in such top course may be covered with slabs of hard burned terra cotta or concrete at least one inch in thickness. Terra cotta concrete or metal slabs or templates of approved size and thickness shall be placed under all floor beams and girders as bearing plates in order that the allowable working stresses shall not be exceeded.

6. Building blocks shall be so laid that the shells and webs shall be superposed upon the shells or webs of the adjacent block or blocks below.

7. Hollow blocks when used to form lintels, which are not keyed arches, shall be reinforced with steel rods, and be filled solidly with concrete. Such lintels shall be designed in accordance with the unit stresses and other requirements for reinforced concrete as required in Sections 113 and 114.

8. Except for party or fire walls, hard burned terra cotta blocks may be used for walls of skeleton construction having a height not exceeding four stories or 55 feet. The thickness shall be the same as required for brick walls.

Terra cotta blocks faced with brick bonded in the manner specified in the last half of Paragraph 8, Section 80, may be used for walls of skeleton construction to a height of 10 stories or 125 feet.

SECTION 91. **Existing Walls.** 1. Where an existing party wall is to be incorporated in a new building of skeleton or curtain wall construction, the vertical extension of the existing party wall shall be supported entirely by columns and girders and not by the party wall below, except that such existing party walls may be extended vertically to the height permitted by this Code for its existing thickness, if written approval for such extension is given by the Building Inspector.

2. Should it be desired to increase the height of other existing party or independent walls, which are less in thickness than required under this Code, this shall be done by lining with brickwork to form a combined thickness with the old wall not less than 4 inches more than the thickness required for a new wall corresponding with the total height of the walls when so increased in height. Such lining shall be supported on proper foundations and carried up to such a height as the Building Inspector may require. All linings shall be at least 8 inches in thickness, laid up in cement mortar, bonded by 4 inch by 16 inch brick toothing projecting 4 inches into the old wall at least every 7 feet both horizontally and vertically, and shall be thoroughly anchored to the old brick walls with suitable wrought iron or steel anchors, placed 2 feet apart and properly anchored into the old walls by through bolts or by expansion bolts set in cement or by other approved method. The anchors shall be placed in rows alternating vertically and horizontally with each other, the old walls being first cleaned of plaster or other coatings where any lining is to be built against the same. No wall shall be lined unless in good condition, and then not until written permission so to do has been granted by the Building Inspector.

SECTION 92. **Furred Walls and Hollow Walls**

1. The inside 4 inches of all walls may be built of hard burned hollow brick dimensions of ordinary brick, properly tied and bonded into the walls. Terra cotta, concrete, or gypsum tile or blocks used in linings or furring shall not be considered as forming part of the required thickness of any walls.

2. In all hollow walls of stone, brick or concrete, the same net horizontal section shall be used as if they were solid. The parts of hollow walls shall be connected by approved ties of brick, stone or metal, placed not over 24 inches apart horizontally and vertically. Metal ties shall have the ends bent at right angles, and be not less than ¾ inch wide by ⅛ inch thick, and shall extend into the wall on each side not less than 4 inches.

SECTION 93. **Recesses and Chases in Walls.** 1 Recesses for stairways or elevators may be located within the required thickness of foundations or cellar walls, provided the walls are not thereby reduced to a less thickness than that required for a fourth story wall. Reinforcement shall be supplied where necessary to compensate for the diminished thickness as approved by the Building Inspector.

The brick backing of recesses for alcoves and similar spaces shall not be less than 8 inches thick .

2. No pipe chases shall extend into any wall more than one-third of its required thickness. No horizontal chase shall exceed 4 feet in length in any wall without express permission of the Building Inspector. No recess in a wall shall be made within a distance of 6 feet from any other recess in the same wall.

Chases shall not be permitted within the required area of any pier. Chases or recesses in walls built of hollow blocks shall not be formed by cutting of blocks, or by other method which would impair the strength of the wall.

Neat fitting metal sleeves, or asbestos covering, shall be provided around pipes at each floor level, and the chases at these levels shall be filled with solid masonry for the space of one foot in height.

SECTION 94. **Arches and Lintels.** 1. Openings for doors and windows shall have arches or lintels of masonry or metal, which shall have a bearing at each end of not less than 5 inches on the wall. Bearing plates shall be provided for lintels resting on walls where the span is more than 6 feet. Tie rods shall be used in all arches where necessary to resist the thrust.

2. On the inside of openings less than 4 feet in width in walls of non-fireproof buildings in which lintels or arches may be less than the thickness of the wall to be supported, timber lintels may be permitted which shall rest at each end not more than 2 inches on any wall, and be chamfered or cut to serve as center for a rowlock or keyed arch.

PART XV.

MEANS OF EGRESS

SECTION 95. **Number and Width of Exits and Doors.** 1. Every building over two stories in height, except dwellings, and every story in such building above the second, shall have at least two means of exit remote from each other; one of these shall open to a street or fireproof passage leading to a street, and one may open to a yard or to an approved fire escape located so as to be accessable to public corridors or hallways which must extend to within 10 feet of the street level, or other space deemed safe by the Building Inspector, and of sufficient area to accommodate all persons in the building. Two means of exit remote from each other shall be provided from each story of dwellings when over 2 stories in height.

2. In every building except buildings of Class D, all required exit doors in the first story, including the doors of vestibules, shall open outwards. This requirement shall not prohibit the use of doors which swing both inwards and outwards, nor of sliding or rolling doors in stables, garages, storerooms, and the shipping and receiving rooms of manufacturing, mercantile and industrial buildings, where approved by the Building Inspector.

3. When exit doorways have a clear width of at least 40 inches each, the aggregate widths of such doorways shall be equal to the required width of corridor or stairway served by same. When individual doors are less than 40 inches wide, there shall be one doorway for each 22 inches of required width of corridor or stairway leading to same. Every doorway shall be at least 28 inches wide in the clear. All passageway exit doors shall swing in the direction of exit travel, except in case of horizontal exits where direction of travel may be indeterminate.

All exit doors leading from rooms having an occupancy of 15 or over, shall open in the direction of exit travel, except in schools where fire drills are organized under control of the teachers.

4. The openings of one door shall not be permitted to obstruct another, and the arc of opening of doors which open upon stairway landings or platforms shall not reduce the width of the passageway to less than the required width of the stairs.

5. Every room having an occupancy of more than 75 persons shall have at least two doorways remote from each other leading to exits.

6. Hallways or corridors at the street or court level furnishing exit from stairways, shall be not less in width than the aggregate width of the required stairways which they serve. Every hallway or corridor which may serve as an exit for 50 or more persons shall have at least 44 inches of width for the first

50 persons and 6 inches additional for each additional 50 persons to be accommodated thereby. This computation shall be based on the number of persons in the story having the largest occupancy served by said corridor.

7. At all times when any loft or space is occupied for manufacturing or mercantile purposes, the fastenings or locks on exit doors shall be such as may be easily opened from the inside without the use of keys.

8. In A, A-B,B and C Class building, a clearly painted sign marked "EXIT" in letters not less than 4 inches in height, shall be placed over all exits in the above specified buildings. The elevators shall be provided with similar sign marked "elevator." Such signs shall be illuminated when necessary by means of artificial lighting. The color of such light shall be green.

9. Elevators, escalators and revolving doors shall not be considered in calculating exit requirements.

10. Entrances and doors in tenement houses, theatres, motion picture houses, and places of public or private entertainment, shall be as elsewhere provided in this Code.

SECTION 96. **Stairs and Stairways, Construction of.** 1. All buildings which are used above the first floor for manufacturing or for any purpose whatever if over four stories or 55 feet high, except armories, court houses, dwellings, fire houses, jails, libraries, museums, police stations, prisons, railway stations, and similar buildings, shall have the required stair shafts separately and continuously enclosed, as specified in Section 67. In fireproof buildings all stairs, platforms, landings, and stair hallways, including the flooring, shall be of fireproof construction. Storage of combustible material is prohibited within the stairway enclosure.

2. All stairs, platforms, landings, balconies and stair hallways, shall be of sufficient strength to sustain safely a live load of not less than 100 pounds per square foot for interior construction, and 150 pounds per square foot for exterior construction, with a factor of safety of 4 in each case, and dwellings shall conform to all the requirements of this section as to hand rails, newels, landings, widths, exits, and prohibition against winding treads. The space beneath any stairway built in whole or in part of in-

combustible material shall be left entirely open or be completely enclosed without door or other opening.

3. No stories in any building shall be connected by an open shaft or stairway except dwellings and buildings mentioned in Paragraph 1; also theatres as provided in Section 180.

4. Stairways used as required means of exit shall be at least 44 inches wide between faces of walls, or 40 inches wide between face of wall and open balustrade, or between two open balustrades. All such widths shall be clear of all obstructions except that hand rails attached to walls may project not more than 3½ inches within them. If newels project above tops of rails, a clear width of at least 44 inches shall be provided between the faces of the newel and the face of the wall or newel opposite. All stairs shall have walls or well secured balustrades or guards on both sides, and except in dwellings, shall have hand rails on both sides. A stairway of 7 feet or more in width shall be provided with a continuous intermediate hand rail substantially supported. All stairs shall have tread and risers of uniform width and height throughout each flight; the rise shall be not more than 7¾ inches, and the tread exclusive of the nosing not less than 9½ inches. Stairways exceeding 12 feet in height shall have an intermediate landing.

Buildings in which there may be a congregation of people for civic, political, educational, religious or amusement purposes, except as provided for theatres in Section 180 and in those used for the care or treatment of persons, all stairs exceeding 8 feet in height shall have an intermediate landing. All landings shall be at least 3 feet in length.

5. No arrangement of treads known as winders shall be permitted in required stairways between the level of the top floor and the street, excepting in public and other special buildings where the use and arrangement is approved by the Building Inspector.

6. Whenever the treads or landings are of slate, marble, stone or composition, they shall be supported for their entire length and width by a solid metal plate at least ⅛ inch thick, securely fastened. If stairs are of incombustible material, other than metal, and treads and landings are each solidly supported for their entire length and width by masonry, metal supports for treads may be omitted.

7. All stairways that serve as required means of exit for one or more of the upper four stories of

every building shall be continued their full width to the roof, and shall lead by a direct line of travel to the first story, and open directly on the street, or to an open-air-or fireproof passage leading to the street, or to a yard or court connected with the streets. Such fireproof passage shall be not less than 7 feet in height.

8. The continuity of all stairs which may be used for exit purposes, shall be interrupted at street level by partitions or doors, or other means which will indicate the main floor level and make clear the direction of egress to the street.

9. Every enclosed stairway shall be provided with an adequate system of lighting, arranged to insure reliable operation when through an accident or other causes the regular lighting is extinguished.

10. All required stairways shall be constructed in one of the following three ways, and shall be known as stair exits:

(a) **Enclosed Interior Stairways.** The stairs, landings, platforms and passageways connected therewith, shall be completely enclosed by fireproof partitions of the standard required in Sections 67 and 20, except that no glass panels shall be permitted in the doors in buildings of Class A not exempted in paragraph 1.

(b) **Smokeproof Tower.** The stairs, landings, and balconies or platforms, shall be solid and completely enclosed as required for interior stairways in Section 67, and shall extend from the sidewalk, court, or yard level, to and above the roof to form a bulkhead. There shall be no openings in any wall separating the stairway from the building, but fixed or automatic fire-windows sufficient for lighting purposes are not objectionable in the exterior walls, provided they are not subject to fire exposure hazard from the same or nearby buildings. Access shall be provided to the stairway from every story of the building by outside balconies of steel or masonry, or by vestibules within the walls of the building, but open at least on one side. Every such balcony or vestibule shall open upon an open space not less than 100 square feet in area. The balcony or vestibule shall be provided with a solid incombustible floor. Railings of steel, or other approved incombustible material, shall be provided not less than 4 feet high. Access to the balcony or vestibule from the building and to the sairways from the balcony or vestibule shall be by approved self-closing fire doors not less than 40 inches wide and 7 feet high, which shall swing in the direction of exit travel. The doors shall be provided with locks or latches with visible fastenings requiring no keys to open them. A wired glass panel shall be provided in the door opening into the stair shaft of not less than one-third its area. The level of the balcony or vestibule floor shall be not more than 7¾ inches below the door sill of the building. Landings in such stairways shall be of a width that the doors in opening into the stairway shall not reduce the free passageway of the landing to a width less than the width of the stairway.

(c) **Outside Exit Stairways Except When Installed on Street Face of Building.** Such stairs shall be connected to each story by means of an approved self-closing fire door and incombustible balcony. The door shall be not less than 40 inches wide, and the balcony shall be the same width as the stairs. All wall openings within 10 feet of such stairs shall be protected by approved self-closing fire doors on doorways, and automatic or fixed fire windows on window openings. No riser on such stairs shall be nearer than 4 feet to any such wall opening, except to doors giving access to the same. Metal mesh or other rigid guards at least 4 feet high shall be provided on each side of such stairways throughout. Provisions shall be made to properly drain the stairs and landings.

SECTION 97. **Requirements for Exits and Stairways.** 1. Every building hereafter erected, and every building altered or converted to increase its occupancy, excepting dwellings, tenement houses, theatres, and assembly halls, which are elsewhere provided for, shall have exits and stairways as required in this section.

2. The term FLOOR AREA in this section shall mean the entire space in a given story between exterior walls, fire walls or fire exit partitions, except that in computing such area the space occupied by walls, partitions, columns, and all shafts may be excluded.

(b) The term STAIR EXIT IN this section shall be as required in paragraph 10, section 96.

(c) The term HORIZONTAL EXIT shall be understood to mean one or more openings through or around a fire wall, fire exit partition, or any wall separating two buildings; no such opening shall be less than 30 inches wide; or such an exit may be an exterior bridge or balcony connecting two buildings or two floor areas of the same building. Where there is a difference in level between connected buildings or floor areas, gradients shall be provided of not more than 1 foot in 6 feet where practicable. The bridges or balconies shall be not less than 44 inches wide, and shall be constructed of incombustible material, and enclosed on the sides at least 4 feet high. All exterior exposing openings in connected buildings or floor areas within 10 feet of bridge or balcony shall be protected by fire doors or fire windows with fixed or automatic sash. The floor of a bridge or balcony shall be not more than 7¾ inches below the door sill opening upon it; the connecting floor within the building shall be not more than 1 inch below the sill. Every such bridge or balcony when enclosed shall be provided with means of lighting.

All horizontal exits shall be provided with self-closing fire doors. Such doors shall be kept unlocked during the occupancy of any portion of the floor areas or connected buildings. No glass shall be used in such doors when used on exits through fire walls as provided in Section 88, paragraph 4. Wired glass may be used in doors in other horizontal exits, provided it conforms to the requirements in Section 98.

3. (a) In all buildings not exempted in paragraph 1 of this section, one of the two required means of exit from every floor area above the first floor shall be a stair exit, and the other may be a stair exit or a horizontal exit. No part of any floor area above the first floor, excepting buildings of Class F Shall be more than 100 feet distance from an entrance to one such means of exit.

When a building over 35 feet in height is occupied for business purposes on the lower floor and for the home of not more than two families on the floors above, at least one continuous enclosed stairway shall be provided to the street level through the stories occupied for business.

(b) In buildings of Class E, over 55 feet high, except office buildings, one of the two required means of exit shall be either a smokeproof tower or an interior enclosed stairway with self-closing doors opening into hallways which are also enclosed with fireproof partitions as specified in Section 118.

(c) In every building over 90 feet in height one of the required means of exit shall be a smokeproof tower or a horizontal exit as herein defined.

4. In determining the occupancy of any building, the width of stairways required for any floor area above the first floor shall be determined by the number of persons occupying such floor space, computed on the basis of fourteen persons for each 22 inches width of stairway, plus one person for every 3 square feet of hallway floor and stairway landing in the story height of such floor, excepting that in any building where a system of automatic sprinklers is installed throughout the entire building, as required in Section 101, the number and width of stairways may be computed on the basis of twenty-one persons for each 22 inches width of stairway; and excepting that when horizontal exits are provided as required in paragraph 2 (c) of this section, the number and widths of required stairways for floor areas above the first floor may be diminished to a basis of fifty persons for each 22 inches width of horizontal exit, provided that in no case there shall be less stairway or means of exit than required in paragraph 3 (a) and (b) of this section.

5. Exits shall also be provided from the cellar, basement, and first story of every building as may be required by the Building Inspector.

6. The number of exits and stairways in tenement houses shall be as required in the Tenement House Law, Sections 287-295 National Code.

SECTION 98. **Fire Exit Partitions.** 1. Partitions, erected to furnish horizontal exits, shall be built of fireproof materials. No construction shall be used for such partitions less than 4 inches thick, unless it has been approved after a fire test as prescribed in Section 174, National Code, or tile construction, or less than 2 inches thick of reinforced concrete or solid metal lath and cement plaster construction, except as herein permitted for non-fireproof buildings.

When tile or block partitions are less than 5 inches thick, substantial protected reinforcement shall be provided at intervals not exceeding 20 feet in length to resist the effect of buckling due to heat.

2. Fire exit partitions shall be supported at each floor, and shall be securely anchored to the walls, floor, and ceiling of the room which they sub-divide. In fireproof buildings such partitions shall rest upon the fireproofing of the floor.

3. In non-fireproof buildings fire exit partitions shall be not less than 3 inches thick if of block or tile construction, and not less than 2 inches thick if of reinforced concrete or solid metal lath and cement, or as permitted in Class B buildings, and shall be continuous through all stories of the buildings and be placed one above the other. The space between floor joists included between the top of a partition in one story, and the bottom of the corresponding partition in the story above, shall be completely fire-stopped with incumbustible material.

4. Doorways, in fire exit partitions shall be not more than 60 feet apart, but doorways may be omitted if approved means of exit around the partitions are provided. No openings other than doorways protected by fire doors, shall be placed in such partitions except that the fire windows not exceeding ½ of 1 per cent. of the area of the partition may be permitted where strictly necessary for purposes of observation. Such fire windows shall have fixed sash, and may be placed either in the partition itself or in the doors. Windows placed in partitions shall also be protected by automatic closing fire shutters. No single pane shall exceed 144 square inches in area, and not more than one pane shall be placed in a door.

5. Wired glass panels not exceeding 720 square inches in area are permitted in doors of fire exit partitions in corridors of hotels, clubs, dormitories and similar buildings.

SECTION 99. **Exits and Protection for Existing Buildings.** 1. Where the exit facilities of existing buildings are found by the Building Inspector to be inadequate, additional exits, sprinklers, or other protection shall be provided of approved types.

In case the Building Inspector may have declared an existing building unsafe, and ordered increased exit facilities, Sprinklers or other protection, appeal may be made from such order to a Board of Appeals, as provided in Section 197. The decision of that survey shall be final, and when it has been complied with, the Building Inspector shall issue a certificate of occupancy to accord with such decision.

SECTION 100. **Engineers' Stationary Ladders.** Every building in which highpressure steam boilers are placed in the cellar or lowest story shall have stationary ladders (iron) or stairs from such story leading direct to a manhole through the sidewalk or other outside exit in addition to another approved means of entrance and exit.

PART XVI.
SPRINKLER SYSTEM

SECTION 101. **Specifications.** For specifications governing sprinkler systems, reference will be had to the National Board of Fire Underwriters Requirements for Installation and Maintenance, current edition.

SECTION 102. **Standpipe Requirements.** Standpipes for Fire Department Use. 1. In existing buildings not already provided with a 4 inch or larger standpipe, and in buildings hereafter erected, there shall be provided:

For buildings in excess of 4 stories or 55 feet in height and not within 75 feet of exposing buildings, a standpipe not less than 4 inches in diameter;

For other buildings in excess of four stories or 55 feet in height, a standpipe not less than 5 inches in diameter;

For buildings in excess of six stories or 75 feet in height, a standpipe not less than 6 inches in diameter.

2. Standpipes shall be located within fireproof stairway enclosures. Provided that, where existing buildings do not have such enclosures, the standpipes shall be as near stairway as possible or shall be on the outside of, embedded within or immediately inside an exterior wall and within 1 foot of a fire escape, fire tower, or outside exit stairway.

3. One standpipe shall be provided for each separate fire area exceeding 2500 square feet area, with at least one standpipe within 75 feet of every exterior wall in the building.

4. Where more than one standpipe is required in a building they shall be connected at their bases by pipes of sizes equal to that of the largest standpipe, so that water from any source will supply all the standpipes.

5. Standpipes shall extend from the cellar to and through the roof, with a 2½ inch hose connection and gate valve not over 5 feet above floor level in each story, including cellar, and two 2½ inch hose connections, with gate valve for each, on the roof; roof connections to have a controlling gate valve under the roof and arranged to be operated both from above

and below the roof, with ¾ inch drain pipe and valve to prevent freezing.

6. Where standpipes are located inside of buildings, hose sufficient to reach to all parts of the fire section, but not in excess of 100 feet, shall be attached to each outlet, with hose for roof-hydrant either in hose house on roof or on rack in top story near roof scuttle. Hose shall be not less than 2½ inches in diameter, and provided with standard couplings in use by the local fire department.

7. Hose to be approved linen in 50 foot lengths made under specifications recommended by the National Board of Fire Underwriters.

8. Each line of hose shall be provided with washers at both ends, and be fitted with smooth-bore brass play pipe or nozzle at least 12 inches long, with discharge outlet 1⅛ inches in diameter. One spanner to be located at each hose connection.

9. Standpipes shall be wrought iron or steel, galvanized and together with fittings and connections, shall be of such strength as to safely withstand at least 300 pounds of water pressure to the square inch when ready for service, without leaking at joints, valves or fittings; such test to be made by the Chief of the Fire Department.

10. Standpipes shall be connected to a Siamese steamer connection outside of the building by a pipe of diameter equal to that of the largest standpipe supplied. Such connections shall be made on each street front, except that corner buildings have one street frontage of less than 50 feet may have only one connection. Siamese shall be about one foot above curb level, and shall be provided with check valves, and substantial caps to protect thread on the connection; the thread shall be uniform with that used by the local fire department. A suitable iron plate with raised letters shall be provided, reading: "To Standpipe."

Just inside of the building, in a horizontal section shall be placed a straight-way check valve. A drip pipe, with valve to same, shall be placed between said check valve and Siamese connection to properly drain this section to prevent freezing.

SECTION 103. **Standpipes for Private Protection.** 1. In existing and new buildings three stories and higher, and in all buildings having an area of 4500 square feet or over, except as given below, there shall be provided a standpipe not less than 2 inches in diameter, with water supply constantly maintained or furnished automatically with the opening of a hose valve.

Exceptions: Buildings equipped with inside standpipe for fire department use and having also $1\frac{1}{2}$ inch connections with hose attached, and automatic water supply, all as provided in paragraphs 2, 3 and 4 of this section:

Dwellings;

Churches;

Other buildings having maximum undivided fire section of less than 4500 square feet area and provided with at least one $2\frac{1}{2}$ gallon approved chemical extinguisher to each fire section;

Sprinklered buildings where the requirements of this section are met by connecting hose to sprinkler riser.

2. Supply shall be from one of the following sources: Street main, where pressure is sufficient to maintain not less than 25 pounds at hose outlet in top story;

Gravity tank of 2500 gallons capacity, with bottom 25 feet above outlet in top story;

Pressure tank of 3750 gallons capacity, located in top story or on roof;

Automatic pump of at least 250 gallons a minute capacity.

Provided that, if standpipe is intended also for fire department use, tank or pump capacity shall be at least double that given above.

3. Where a standpipe is connected to fire pump or provided with Siamese connection, a straight-way check valve shall be provided in connecting pipe to tank, and tank filled by a separate pipe; and where the water in such tank is also used for house supply, the house supply pipe shall extend above the bottom of the tank to such a height as will reserve for fire purposes not less than the quantities required in paragraph 2.

4. Standpipes shall extend from the cellar to the roof, with a $1\frac{1}{2}$ inch hose connection and gate valve not over 5 feet above floor level, in each story, including cellar and roof.

Hose sufficient to reach to all parts of the fire section, but not in excess of 100 feet, shall be attached to each outlet; hose for roof outlet may be placed on rack in top floor near the scuttle leading to the ½ inch discharge outlet.

5. Standpipes and hose shall comply with the requirements of Section 101, except that 150 pounds test pressure will be required.

PART XVII

CHIMNEYS, FLUES, HEATING APPARATUS AND VENTILATION

SECTION 104. **Chimneys, Smoke Flues, Gas Flues and Fireplaces.** 1. All chimneys hereafter erected shall be of brick or stone laid in Portland cement mortar without addition of lime, reinforced concrete or other approved incombustible material, extending at least 3 feet above the point of contact with a flat roof or 2 feet above the ridge of a pit roof, and shall be properly capped with terra cotta, stone cast iron, or other approved incombustible weatherproof material.

2. The brickwork or reinforced concrete of the smoke flues of all boilers, furnaces, baker's ovens, large cooking ranges, large laundry stoves, and all flues used for a similar purpose shall be at least 8 inches in thickness. Walls of smoke flues used exclusively for ordinary stoves or open fireplaces shall be not less than 4 inches thick. Brick set on edge shall not be permitted in chimney construction.

3. Where two or more smoke flues are contained in the same chimney, the walls between the several flues shall be not less than 4 inches thick. The walls of stone smoke flûes shall be 4 inches thicker than required for brick or reinforced concrete. No smoke flues shall have smoke pipe connections in more than two stories of a building.

4. Every smoke flue contained in a chimney hereafter erected shall have an area of at least 64 square inches and, unless required to be lined with fire brick, shall be lined with hard burned terra cotta or fire clay lining made smooth on the inside. The flue lining shall start from the bottom of the flue, or from the throat of the fireplace if the flue starts from a fireplace, and shall be carried up continuously the entire height of the flue. If the thickness of the masonry surrounding the throat be less than 8 inches in any part, the lining shall start at the bottom of the lintel. The ends of the sections of all such linings, tile shall be laid in cement mortar and the tile shall be built in as the flues are carried up.

No parging mortar nor plaster shall be used on the inside of any fireplace, chimney or flue.

5. In every building, where one or more smoke flues start from the cellar or lowest story, at least

one such smoke flue shall have an internal cross-section area of at least 96 square inches and shall start at least 3 feet below the ceiling.

6. In no case shall a chimney be corbeled more than 8 inches from the wall, and such corbeling shall consist of at least five courses of brick. Piers which support chimneys shall start from the foundation on the same line with the chimney breast. They shall be not less than 12 inches on the face and shall be properly bonded into the walls. No chimney shall rest upon, nor be carried by woodwork. No combustible furring or sheathing shall be placed against any smoke flue or chimney breast.

7. Walls of flues used only for gas burning appliances shall be of concrete at least 4 inches thick and lined as required in paragraph 4 of this section. Where two or more such flues are contained in the same chimney, the walls between the several flues shall be not less than two thicknesses of the tile lining with joints broken, except that at least every third partition shall be not less than 4 inches thick of brick or its equivalent, and bonded into the walls. No more than one appliance or utensil in which gas is used as fuel shall be connected to a single flue, nor shall any such appliance or utensil be connected to any flue to which a smoke pipe is connected.

8. The smoke flue of every high pressure steam boiler and every appliance producing a corresponding temperature in the smoke flue shall, if built of brick, stone, reinforced concrete or other approved masonry, be lined on all sides with not less than 4 inches of fire brick laid in fire mortar for a distance of at least 25 feet from the point where the smoke connection of the boiler enters the flue.

9. Interior vertical smoke stacks or flues for steam boilers or other furnaces, and similar heating devices producing a corresponding temperature, may be of metal not less than No. 10 U. S. gauge, properly riveted, jointed, and braced at intervals of at least 20 feet. Such stacks shall either be inclosed by approved masonry walls not less than 8 inches thick with an air space of at least 4 inches between lining and wall; or if such stacks or flues are not enclosed with masonry they shall have a clearance from all combustible material of not less than one-half the diameter of the stack, but not less than 24 inches, unless the combustible material be properly guarded by loose fitting metal shields in which case the distance shall be not less than 12 inches.

Where such a stack passes through a wooden frame roof, it shall be guarded by a galvanized iron ventilating thimble extending from at least 9 inches below the underside of the ceiling or roof beams to at least 9 inches above the roof, and the ventilating thimble shall have a clearance of not less than 18 inches, except that for stacks for low grade furnaces such as hot air, hot water, and low pressure steam heating furnaces, coffee roasting ovens, candy furnaces, etc., the clearance may be reduced to 12 inches. Metal smoke stacks shall not be permitted to pass through the floors. Smoke flues shall not be permitted inside of vent flues for ranges.

10. Exterior metal smoke flues for boilers, large cooking ranges, and similar heating devices, shall be of approved construction and supported on approved masonry foundations, and shall have a clearance of at least 4 inches from the outside wall. Such flues having an area not exceeding 255 square inches shall be constructed of not less than No. 16 U. S. gauge metal; if the area exceeds 255 square inches the thickness of the metal shall be not less than No. 10 U. S. guage.

11. The smoke flue of every smelting furnace and of every other similar device which heats the flue to an extremely high temperature, shall be built with double walls of thickness suitable for the temperature. There shall be an air space between the walls, and the inside walls shall be of firebrick not less than 4 inches thick.

12. Chimneys of cupola-furnaces, blast-furnaces, and similar devices, shall extend at least 10 feet above the highest point of any roof within a radius of 50 feet, and no woodwork shall be within 3 feet of any part of any such device or its chimney.

13. When a building or structure extends more than 10 feet above the roof of an adjoining building or structure, the owner of the higher building, if requested in writing during its construction by the owner of the adjoining building or structure, shall at his own expense extend the adjoining flues of such adjoining building to the same height as the chimneys of his building, or shall supply sufficient flues connecting such adjoining flues with the chimneys of his building. Such extension may be made with 16 guage galvanized iron.

14. All fireplaces and chimney breasts where mantels are placed, whether intended for ordinary fireplace use or not, shall have trimmer arches or other approved fireproof construction supporting hearths. The arches and hearths shall be at least 20 inches in width meas-

ured from the face of the chimney breast. The arches shall be of brick, stone, terra cotta, or reinforced concrete of approved thickness. The length of the trimmer arch and the length of the hearth shall be not less than the width of the chimney breast. The hearth shall be of brick, stone, tile or other approved fireproof material. False fireplaces shall only be permitted against unfurred masonry walls.

15. No coal burning heater shall be placed in a a fireplace which does not conform to the foregoing requirements and have an incombustible mantel. No wood mantel or other woodwork shall be placed within 8 inches of the side nor within 8 inches of the top of any open fireplace. No combustible summer piece or fireboard shall be used in connection with any open fireplace. The firebacks of all fireplaces shall be of solid masonry not less than 10 inches thick.

16. When a grate is set in a fireplace, a lining of firebrick at least 2 inches in thickness shall be added to the fireback, or soapstone, tile or cast iron may be used, if solidly backed with brick or concrete.

All flue-holes when not in use shall be closed with tight-fitting metal covers.

SECTION 105. **Smoke Pipes.** 1. No smoke pipe shall pass through any floor, nor through a non-fireproof roof. Smoke pipes for large cooking ranges, hot air furnaces, low pressure steam or hot water boilers shall be not less than 18 inches below any wood lath and plaster or other combustible ceiling, unless at least the upper half of such smoke pipe is properly protected by 1 inch or more of asbestos covering or its equivalent, or by a metal casing spaced 2 inches from the upper half of the pipe. If so protected smoke pipes shall be not less than 9 inches from any wood lath and plaster construction, woodwork or other combustible material. Smoke pipes from ordinary stoves shall be not less than 9 inches from any exposed woodwork.

2. Where a smoke pipe passes through a wood lath and plaster or other combustible partition or wall, a section of the partition or wall shall be removed and the smoke pipe so placed that no part of it shall be nearer than 12 inches to any remaining combustible part of the partition. The section of the partition or wall so removed shall be replaced by approved fireproof material only,and an air space of at least 2 inches shall be preserved on all sides of the smoke pipe.

SECTION 106. **Heating Furnaces And Appliances.** 1. High pressure steam boilers, bakery ovens or furnaces in which fires are maintained producing a high degree of heat, shall rest on the ground, a trimmer arch, or a fireproof floor constructed in accordance with Section 107.

2. Low pressure heating boilers, coffee roasters, fire-heated candy kettles, laundry stoves, coal ranges without legs, and similar appliances where hot fires are used, shall rest upon fireproof foundations as above described. However, the Building Inspector's written permission may allow them to be placed upon wooden floors if the floors are protected by sheet metal of one-eighth inch layer of asbestos building lumber, covered with not less than 4 inches of masonry set in cement mortar. Such masonry shall consist of one course of 4 inch hollow terra cotta or of two courses of brick or terra cotta, at least one of which shall be hollow and be laid to preserve free circulation of air throughout the whole course. Concrete may be substituted for a course of solid brick if desired. The masonry work shall be covered by sheet metal of not less than No. 26 guage, so arranged as not to obstruct the ventilating passages beneath. Such hearths shall extend at least 12 inches on the sides, back, and front of the furnace, range or similar heating appliance. If solid fuel is used, the front extension shall be at least 24 inches.

All stoves or ranges with legs shall be set on incombustible material which shall extend at least 24 inches in front when solid fuel is used.

3. Any woodwork or wooden lath and plaster partition within 4 feet of the sides or back, or 6 feet from the front of any such boiler furnace, or heating appliance, shall be covered with metal shields or other approved incombustible material to a height of at least 4 feet above the floor. This covering shall extend the full length of the boiler, furnace or heating appliance, shall be covered with metal shields or other approved incombustible material to a height of at least 4 feet above the floor. This covering shall extend the full length of the boiler, furnace, or heating appliance, and to at least 5 feet in front of it. Such metal shields shall be so attached as to preserve an air space behind them. In no case shall such combustible construction be permitted within 2 feet of the sides or back of the heating appliance, or 5 feet in front of same.

4. Heating boilers shall be encased on sides and top by incombustible protective covering not less than 1½ inches thick, and the overhead clearance of such

covered boilers and hot air furnaces shall be not less than 15 inches. Any woodwork within 2 feet of the top of such boilers or furnaces shall be protected by a loose fitting metal shield, but such shields shall not be placed so as to form concealed spaces.

SECTION 107. **Stoves And Ranges.** 1. No kitchen range or stove in any building shall be placed less than 2 feet from any woodwork or wooden lath and plaster partition, unless the woodwork or partition is properly protected by metal shields, in which case the distance shall be not less than 6 inches. Metal shields shall be so attached as to preserve an air space behind them.

2. Hotel and restaurant ranges shall be provided with a metal hood placed at least 9 inches below any wooden lath and plaster or wooden ceiling, and have an individual pipe outlet connected with a flue in accordance with the requirements of Section 110. The pipe shall be protected by at least 1 inch of asbestos covering, or its equivalent.

3. No furnace, boiler, range or other heating appliance shall be placed against a wall furred with wood.

SECTION 108. **Hot Air Pipes And Registers.** 1. All stone or brick hot air flues shall be lined with tin or other suitable sheet metal or burnt clay pipe.

2. Horizontal hot air furnace pipes shall be placed at least 4 inches below wooden floor beams or wooden lath and plaster ceiling; if the floor beams or ceiling are protected by metal lath and plaster, or if the woodwork be covered with loose fitting tin, or the pipe be covered with at least ⅛ inch of asbestos, the distance from the woodwork may be reduced to not less than 2 inches.

3. Hot air pipes where passing through combustible partitions or floors, must be covered with not less than 1 inch thickness of approved asbestos sheet covering.

No hot air pipe shall be placed in a wooden stud partition or any wooden enclosure unless it be at least 8 feet horizontal distance from the furnace. Hot air pipes contained in combustible partitions shall be securely covered with ⅛ inch asbestos.

5. Every hot air furnace shall have at least one register without valve or louvres.

6. A register located over a brick furnace shall be supported by a brick shaft built up from the cover of the hot-air chamber; said shaft shall be lined with a

metal pipe, and no woodwork shall be within 2 inches of the outer face of the shaft.

A register box placed in the floor over a portable furnace shall have an open space around it of not less than 4 inches on all sides, and be supported by an incombustible border.

The register box shall be of metal covered with asbestos not less than ⅛ inch in thickness.

SECTION 109. **Steam And Hot Water Pipes.** No high pressure steam or hot water pipe shall be within 1 inch of any woodwork. Every steam or hot water pipe passing through combustible floors, or ceilings, or wooden lath and plaster partitions, shall be protected by a metal tube 1 inch larger in diameter than the pipe and be provided with a close-fitting metal cap on each side of the floor or partition. All wooden boxes, or casings enclosing steam or hot water heating pipes, or wooden covers to recesses in walls in which steam or hot water heating pipes are placed, shall be lined with metal, and the pipes shall be kept at least 1 inch away from the walls of the box. Steam and hot water pipe coverings shall be of incombustible material.

SECTION 110. **Vent Flues And Ducts.** 1. Vent flues or ducts for the removal of foul air in which the temperature of the air cannot exceed that of the room, may in non-fireproof buildings. be constructed of sheet metal or other incombustible material. When used in connection with an exhaust fan, such duct shall not be placed nearer than 1 inch to any woodwork. All such ducts shall open to the outside of the buildings.

2. All openings into such vents or ducts shall be protected by automatic or self-closing fire doors, or by automatic closing metal louvres or dampers.

3. Vent flues and ducts connected with hoods over restaurant ranges shall be constructed in accordance with the requirements for smoke flues, Section 104, and for smoke pipes, Section 105, and shall be used for no other purpose.

4. All ducts from blower heating and ventilating systems which pass through stories shall be made of or protected throughout by approved fire-resisting material not less than 3 inches thick if of brick, block, or tile; or 2½ inches of solid metal lath and cement plaster. Where such ducts serve more than one story, automatic dampers shall be provided on all outlets opening directly from such ducts and at all connections with branch ducts.

SECTION 111. **Dry Rooms.** No combustible materials shall be permitted in the construction of any room in which a temperature of 125 degrees F. or over may exist. If a temperature of 125 degrees F. is to be used, the dry room may be constructed of wood, but shall be lined throughout with ⅛ inch asbestos or ¼ inch plaster board and covered with sheet metal; or the covering may consist of metal lath or plaster board, plastered to a total thickness, of at least ¾ inch. Cement plaster or cement-tempered plaster shall be used.

SECTION 112. **Boiler And Furnace Rooms.** All rooms housing heating plants in any building within the fire limits, and in all Public Buildings as defined in Section 32, paragraph 2, whether within or without the fire limits, shall have walls built of fireproof materials, with self-closing or automatic fire doors, and shall have ceiling fireproofed with metal lath and ¾ inch cement plaster or 3-8 inch plaster board or sheet asbestos.

PART XVIII.

SECTION 113. **Fireproof Construction And Fireproofing.** General Requirements for Fireproof Buildings. 1. The walls of every fireproof building shall be constructed as specified in Section 80 to 88. Reinforced concrete buildings constructed as specified in Part XIX, shall be classed as fireproof construction.

2. The space between the floor arches or slabs and the floor finish shall be solidly filled with concrete as specified in Section 174. The filling beneath wooden flooring shall be made flush with the underside of the floor boards.

3. In buildings of Class E, except stables, also in apartment houses, clubs and hotels, when of fireproof construction, the floors shall be made impervious to water; they shall also be arranged to drain to scuppers or interior drainage pipes, provision being made to discharge water at the rate of 300 gallons per minute per each 100 square feet of floor area.

4. Except as permitted in Section 96, paragraph 1, all shafts and public hallways shall be enclosed and separated from the rest of the floor space by fire-resistive enclosures, as specified in Sections 67 and 118 and shall have floor surface and trim of approved incombustible material. The stairs and stairway landings shall be of approved incombustible material.

5. No woodwork or other combustible material

shall be used in the construction of any fireproof building, except wooden floor sleepers, grounds, bucks, and nailing blocks when entirely embedded in incombustible material; also the finish flooring, and interior doors and windows, when not otherwise specified, with their frames, trim, and casings; also interior finish when backed solidly with fireproof material, may be of wood. Wooden wainscoting more than 3 feet high, or wooden ceilings, shall not be permitted.

6. Exterior wall openings shall be protected as required in Section 65.

SECTION 114. **Fireproofing, Floor And Roof Construction.** 1. Fireproof construction between steel floor or roof beams, shall consist of segmental arches of brick or concrete, or of segmental or flat arches of hollow terra cotta, or reinforced cinder, stone, or gravel concrete; or of such other equally fire-resisting material or construction as may be approved by the BUILDING INSPECTOR after fire, water, and strength tests.

2. All segmental arches shall have a rise of 1¼ inches to the foot of span. Steel tie-rods of proper size, spacing, and location shall be used in all arches to properly resist the thrust. Such tie rods shall be completely escaped to a depth of at least 2 inches in fireproofing material which shall extend into and be anchored to the earth.

3. The spacing of floor or roof beams in fireproof construction shall not exceed 8 feet on centers except when the slabs between them are composed of reinforced stone or gravel concrete, in which case they shall be limited by the design according to Section 135.

4. BRICK ARCHES. Segmental arches of brick shall have a thickness of not less than 4 inches for spans of 5 feet and not exceeding 8 feet. Brick arches shall be composed of good, hard common or hollow brick. The brick shall be laid to a line on the centers and properly and solidly bonded; each longitudinal line of brick shall break joints with the adjoining lines. The arches shall spring from suitably designed solid skewbacks made of the same materials as the arches, and be properly keyed. The brick shall be well wet before laying, and the joints solidly filled with mortar.

5. TERRA COTTA ARCHES. Hollow terra cotta tile used for floor or roof arches shall be hard burned or semiporous and of uniform density and hardness. All terra cotta arches shall be properly keyed. The key

blocks shall always be placed within the middle third of the span.

Segmental arches shall have sufficient depth between the top and bottom faces to carry the load to be imposed, but not less than 6 inches. The tile shall have at least two cellular spaces in the depth.

Flat arches shall have a depth of not less than 1¾ inches for each foot of span between the beams, this not to include any portion of the depth of tile that projects below the under side of the beams. The total depth shall in no case be less than 9 inches, and the tile shall have not less than three cellular spaces in the depth.

The shells of arch blocks shall be not less than ¾ inch in thickness, and the webs shall be not less than ⅝ inch in thickness. Every arch block shall have at least one continuous vertical internal web for each 4 inches in width. There shall be rounded fillets at all internal intersections. The skewbacks of all hollow tile arches shall be of such form and section as to accurately fit the beams and properly receive the thrust of the arches, and shall have shells at least 1 inch thick, and webs not less than ¾ inch thick.

The safe working load on terra cotta arches shall be determined by design or by test as specified in Section 177. The allowable extreme fibre stress in compression in terra cotta floor tile shall be taken as 500 pounds per square inch on net section.

6. CONCRETE ARCHES AND SLABS. All segmental arches or flat slabs of reinforced concrete shall be designed and constructed in accordance with the requirements of this section and of Part XIX.

7. ROOFS. Hollow terra cotta or concrete tile, or solid gypsum blocks, may be used for fireproofing between the steel framework of roof construction; but such tile or blocks shall be not less than 3 inches thick, and the supporting steel members shall be spaced not more than 25 inches on centers. When solid blocks or tile are properly reinforced to resist the bending stresses, the steel supporting members may be spaced not to exceed 30 inches apart. The bottom flanges of steel members shall be protected as elsewhere provided.

SECTION 115. **Firproofing, Protection Of Structural Members.** 1. Protection of Wall Columns. All columns which support steel girders carrying exterior walls, and all columns which are built into walls and support floors only, shall be protected against corrosion by a coating of Portland cement mortar at least ¼ inches thick, and against moisture and fire by a casing of masonry, which shall be not less than 4 inches of brick or 3 inches of concrete on all surfaces; all to be well bonded into the masonry of the enclosing walls.

2. Protection of Wall Girders. The wall girders shall have a casing of Portland cement mortar and the same masonry protection as required for wall columns, all to be securely tied and bonded; but the extreme outer edge of the flanges of beams, or plates or angles connected to the beams may project within 2 inches of the outside surface of such casing. The inside surfaces of the girders shall be similarly protected by masonry, or if projecting inside the walls, they shall be protected by concrete, terra cotta, or other approved fireproof material not less than 2 inches thick.

3. All metal structural members which support loads or resist stresses, other than those provided for by the two preceding paragraphs, shall have a protection of fireproofing as herein specified. The protection material shall be brick, concrete, terra cotta, or gypsum block. Concrete shall be of the quality prescribed in Sections 164 to 170; terra cotta may be solid or hollow, and shall be porous or semiporous, neither shells nor webs shall be less than ⅝ inch thick; gypsum blocks shall be solid and of quality approved by the Building Inspector. Plaster shall not be considered a part of any required fireproofing for metal structural members except where specifically mentioned as such.

4. All bricks or blocks used for fireproofing shall be set in Portland cement mortar, except that gypsum blocks may be set in gypsum mortar.

5. (a) Interior Columns. The protection shall cover the columns at all points to a thickness of not less than 3 inches and be continuous from the base to the top of the column. The extreme outer edges of lugs, brackets, and similar supporting metal may project to within 1 inch of the outer surface of the protection.

(b) If brick or blocks are used for fireproofing columns, they shall be accurately fitted, laid with broken joints, and all spaces between the outside layer and the metal solidly filled with masonry; or a concrete filling may be used. No voids between the metal and the protecting casing shall be permitted.

(c) Galvanized steel wire not smaller than No. 12 gauge, shall be securely wrapped around block column coverings so that every block is crossed at least once by a wire. The wire shall not be wound spirally around the column, but each turn or band shall be a separate unit and shall be twisted tightly or otherwise securely bound. Other equivalent anchorage may be employed if approved by the Building Inspector. No block used for this purpose shall exceed 12 inches in vertical dimension.

(d) Columns located in damp places shall receive a coat of at least 1 inch of Portland cement mortar before application of the fireproofing.

(e) Columns made of steel or wrought iron pipe filled with concrete shall be protected by at least 1½ inches of fireproofing.

(f) Where the fireproofing of columns is exposed to damage from trucking or handling of merchandise, the fireproofing shall be jacketed on the outside for a height of not less than 3 feet from the floor with metal or other approved covering.

6. PROTECTION OF STEEL GIRDERS AND BEAMS.

(a) The protection of the webs and bottom flanges of girders, and all members of trusses shall have a thickness of not less than 2 inches at all points. The protection of the webs and bottom flanges of beams, lintels, and all other structural members shall be not less than 1½ inches at any point.

(b) If hollow terra cotta tile be used for protection, the lower flanges of beams and similar members shall be encased either by lugs which form a part of the skewbacks and extend around the flanges meeting at the middle; or by tile slabs held in position by dovetailed lugs projecting from the skewbacks. In either case care shall be taken to insure that all joints be solidly filled with mortar.

7. Concrete protection for all structural members shall be held in position by suitably designed interior steel anchors hooked securely around the flanges or angles of the members, at intervals not exceeding 8 inches apart; these anchors shall be not less than ⅛ inch in thickness if flat or 1-10 inch in diameter if of wire, and shall be located at a distance not less than ¾ inch, nor more than 1 inch from the outside surface. Provision shall be made to prevent displacement of anchors while concrete is being deposited. When the flange width of steel members exceeds 6 inches, the wire used for anchoring the concrete protection shall be not less than ⅛ inch in diameter.

8. Steel angle or channel struts, or other structur-

al framing not elsewhere provided for, which are used for support in any wall, partition, or other construction, shall be fireproofed as required in this section.

9. Metal fronts on the exterior of buildings over one story high shall be backed up or filled in with masonry not less than 8 inches thick.

SECTION 116. **Miscellaneous Fireproofing Provisions.**

1. Defective or damaged fireproofing materials shall not be used. All fireproof construction injured or damaged after being erected shall be repaired to the satisfaction of the Building Inspector before any filling or finish is placed over same.

2. No pipes, wires, cables or other material shall be incased within or embedded in the required fireproof protection of columns or other structural members.

3. All metal lath and plaster ceilings shall be supported by hangers or clamps attached to the floor or roof construction in an approved manner. Such supports shall be of such section and weight as will support the wet plaster without deflecting more than 1-30 inch per foot of span.

4. All studding for metal lath partitions or wall furring shall be made from steel stock weighing not less than 0.5 of a pound per lineal foot, shall be spaced not over 16 inches center to center and shall be securely fastened to the floor and ceiling construction.

5. Metal lath shall be of galvanized steel weighing not less than 54 oz. per square yard. Wire lath shall be not less than No. 20 gauge, and sheet metal lath not less than No. 24 gauge. Metal lath shall be laced to the supporting furring or studs at intervals not exceeding 6 inches.

6. After floors are constructed, no opening greater than 2 square feet shall be cut through them unless suitable metal framing or reinforcing is provided around the opening. After pipes or conduits are in place, all openings around them shall be filled in solidly with fireproofing material unless approved close fitting individual sleeves are provided as specified in Section 73, Paragraph 7.

SECTION 117. **Protection Of Metal Structural Members In Non-Fireproof Buildings.** Steel girders and steel or iron columns which support masonry walls, other than those facing upon a street, shall be protected by at least 2 inches of fireproofing of the same materials and applied in the manner specified in Section 115 or by 2 inches of metal lath and cement plaster; the latter being applied in two layers with an air space between them. All other iron or steel columns shall be protected by at least one inch of metal lath and cement plaster or its equivalent. The lath shall be of quality specified in Section 116, Paragraph 5.

SECTION 118. **Partitions In FireProof Buildings.** 1. In fireproof buildings, all partitions enclosing public halls or separating the spaces occupied by different tenants, and all other permanent partitions, shall be built not less than 4 inches thick, of solid or hollow brick, terra cotta, concrete, or gypsum blocks or tile; or not less than 3 inches thick of reinforced concrete or solid metal lath and cement plaster; or of other incombustible materials and thickness as shall meet the requirements of the partition fire test as prescribed in Section 176, Paragraph 4. The required thickness for block or tile partitions shall be exclusive of plaster. All such partitions shall be securely fastened to the fireproof construction of the floor and ceiling. All bricks, blocks or tile shall be laid with broken joints.

2. All partitions not enumerated above shall be of incombustible materials, except for woodwork permitted in Section 113, Paragraph 5.

3. All partitions in fireproof buildings shall be independently supported at each floor level, and where lateral support is not sufficient they shall be stiffened by such steel reinforcement encased in the construction as the Building Inspector may require and approve.

4. Structural steel members necessary for supporting a partition or for framing doorways or other openings through it, shall be protected by at least 1 inch of fireproofing. Cement plaster, or cement-tempered plaster may be accepted for this purpose if properly keyed.

5. Reinforced concrete for partitions shall be as required in Sections 123 to 128 and 164 to 170. Terra cotta tile shall be porous or semi-porous in quality, and if hollow, shall have two cells in the thickness, with the thickness of shells inclusive of plaster key, not less than $^3/_4$ inch, and the thickness of webs not less than $^5/_8$ inch. Gypsum shall be used only in dry locations. Metal lath and studding shall conform to the requirements of Section 116.

6. All openings in public hallway partitions shall be protected by approved fire doors or fire windows.

Approved fire doors may be permitted in a partition separating tenants in a building, but no glass shall be permitted in openings in such partitions.

7. If a stair hallway be considered as a part of the stairway, and the latter is not separately enclosed as required in Section 67, then the enclosing partitions for the hallway shall be considered as the stairway shaft, and shall be built according to the requirements of Section 67.

8. If the partition surrounding a public hallway be erected in accordance with the requirements for a fire exit partition, it may be considered as a horizontal exit for an occupancy equal to area of the hallway in square feet divided by three.

SECTION 119. **Fire-Resistive Partitions In Non-Fireproof Buildings.** 1. In non-fireproof buildings of Classes B, C, D, and E, (according to occupancy) all partitions enclosing public hallways, or separating the spaces occupied by different tenants, shall either be built as required in section 118, or they may be built of not less than 3-inch approved solid or hollow partition blocks or tile, or by 3-inch hollow or 2-inch solid metal studding and lath with cement plaster, or by 2x4 inch wooden studding with metal lath and ¾ inch of cement or cement-tempered plaster on each side; or of any other materials and thickness as shall meet the requirements of the partition fire test as prescribed in Section 176, Paragraph 4. Wooden studs shall be set with the 4-inch dimension at right angles to the plane of the wall.

2. All such partitions shall be fire-stopped the full depth of the floor beams at each floor level in the manner specified in section 73.

3. Openings in such partitions shall be protected by fire doors and windows as specified in section 118.

4. The principles governing hallway partition construction as stated in Section 118, Paragraph 7 and 8 shall apply to the construction of like partitions in non-fireproof buildings, consistent with the requirements of section 70 for such construction.

PART XIX.

REINFORCED CONCRETE CONSTRUCTION AND REINFORCED CONCRETE FOR FIREPROOFING

SECTION 120. **Definition.** The term "reinforced concrete" in this Code shall mean an approved concrete mixture in which steel is embedded in such a manner as to resist the tensile stresses and to add rigidity and strength to concrete incompression.

SECTION 121. **Approved For All Types Of Buildings.** Reinforced concrete will be approved for all types of building construction, provided the design conforms with good engineering practice, and the working stresses do not exceed those herein specified. The construction shall meet the requirements of this Code in all respects, and in addition shall conform to such other rules as may be issued by the Building Inspector or State authorities having jurisdiction.

SECTION 122. **Construction Plans And Specifications.** 1. The plans and specifications required to be filed with the Building Inspector shall, when demanded by the Building Inspector, be accompanied by stress computations and descriptions showing the general arrangement of the entire construction in all important details, including the size, length, and points of bending of all reinforcement, the qualities, proportions, and methods of mixing the materials used in the concrete and the dead and live loads each floor is designed to carry. Notes and calculations of design need not be left with the Building Inspector.

2. All such plans and specifications shall be signed by the architect, engineer, contractor or person applying for the permit. In no case shall the construction deviate from the approved plans and specifications except by written consent of the Building Inspector.

SPECIFICATIONS FOR MATERIALS

SECTION 123. **Quality Of Concrete.** 1. The concrete shall consist of a mixture of a plastic or viscous consistency of one part of cement to not more than six parts of aggregate, fine and coarse, either in the proportion of one part of cement, two parts of sand and four parts of stone or gravel, or in such proportion as to produce a maximum density. Such concrete shall develop a crushing strength of at least 2000 lbs. per square inch at 28 days when made under laboratory conditions of manufacture; the materials and consistency being practically the same as that used in the field. Test specimens shall be removed from moulds as soon as well set and stored in damp sand until tested.

2. Concrete in the proportion of one part of cement to four and one-half parts of aggregate, which may be desirable for special work such as columns,

shall develop a crushing strength of not less than 2,400 pounds per square inch at 28 days, and the working stress of such concrete may be increased 20 per cent over that permitted elsewhere in this part.

3. Each test shall consist of a set of at least three duplicate specimens in the shape of cylinders with a height of double the diameter; or cubes having a least dimension of 6 inches. Cubes shall be tested standing on bed and 75 per cent of the resulting test strength shall be assumed as the strength of the standard cylinder specimen 8 inches in diameter and 16 inches high. The average of the three tests shall be taken as the result for record. The smallest dimension of the test piece should be at least four times the size of the coarsest particle of stone.

4. In addition to these preliminary tests which are necessary for the purpose of design, the Building Inspector may require additional tests to be made upon specimens cast during construction of the building. The test specimens shall be secured at such times and in such portions of the structure as the Building Inspector may direct. This test concrete may be taken from the barrows as the concrete is being wheeled to place or from the forms after it is deposited. The results of such tests shall be considered in conjunction with the test of workmanship described in Section 179.

General requirements for tests, section 162.

Quality of cinder concrete, section 169.

SECTION 124. **Quality Of Cement.** All cement used in rinforced concrete shall be Portland cement meeting the requirements of Section 45.

SECTION 125. **Quality Of Fine Aggregate.** 1. Fine aggregate shall consist of sand, crushed stone, or gravel screenings, passing when dry a screen having ¼ inch diameter holes and not more than 6 per cent passing a sieve having 100 meshes per lineal inch. It shall be clean and free from quicksand, vegetable loam, perishable organic matter, or other deleterious materials.

2. Fine aggregate shall always be tested. It shall be of such quality that mortar composed of one part Portland cement and three parts fine aggregate by weight, when made into briquettes shall show a tensile strength at least equal to the strength of 1:3 mortar of the same consistency made with the same cement and standard Ottawa sand, and shall show a tensile strength of at least 180 lbs. per square inch at the age of 7 days.

If the aggregate be of poorer quality, the proportion of cement should be increased to secure the desired strength.

SECTION 126. **Quality Of Coarse Aggregate.** 1. Coarse aggregate shall consist of crushed stone or gravel which is retained on a screen having ¼ inch diameter holes, and shall be graded in size from small to large particles. The maximum size shall be such that all the aggregate will pass through a 1¼ inch diameter ring. The particles shall be clean, hard, durable, and free from all deleterious material.

2. Gravel shall be free from clay or loam except such as naturally adheres to the particles. If clay or loam is in such quantities that it cannot be readily removed by dipping in water or brushing lightly with the hand, the gravel shall be washed. When bank-run gravel is used, it should be screened from the sand and remixed in the proper proportion for fine and coarse aggregate.

SECTION 127. **Quality Of Reinforcement.** All steel used in reinforced concrete shall meet the requirements of the current Standard Specifications for Billet-Steel Concrete Reinforcement Bars of the American Society for Testing Materials. No reinforcement produced from rerolled rails or second-hand materials shall be used in any structure unless the requirements are met of the current Standard Specifications for Rail-Steel Concrete Reinforcement Bars of the American Society for Testing Materials. Cold drawn steel wire made from open hearth billets of the grade of rivet steel or from Bessemer billets, may be used in floor and roof slabs, column hooping, and reinforcement for temperature and shrinkage stresses. It shall have an ultimate strength of not less than 85,000 pounds per square inch and test specimens shall bend 180 degrees around their own diameter without fracture.

FACTORS CONTROLLING DESIGN

SECTION 128. **Allowable Unit Working Stresses.** In design of reinforced concrete structures when the concrete is mixed in the proportion of 1:2:4, and satisfies the strength requirements of Section 123, the following working stresses for concrete and steel shall be used:

	Lbs. per sq. inch
Extreme fibre stress on concrete in compression ..	650
Concrete in direct compression	500

Shearing stress in concrete when diagonal tension is not resisted by steel	40
Shearing stress in concrete when web reinforcement is proportioned to resist two-thirds of the external vertical shear	120
Bond stress between concrete and plain reinforcing bars	80
Bond stress between concrete and deformed bars..	100
Tensile stress in steel reinforcement	16,000

Bearing on a concrete surface having a total area at least three times the area of the loaded portion, may be taken at 37½ per cent of the ultimate strength of the concrete, when all other stresses are properly provided for.

Compressive stress in steel as specified in Sections 144, 145 and 146, or in the ratio of the moduli of elasticity of the steel to concrete.

In continuous beams the extreme fibre stress in concrete in compression may be increased 15 per cent adjacent to the supports.

In proportioning the section of concrete for shearing stresses, the effective depth from center of compression area to center of steel shall be used.

Stresses in concrete mixed in the proportions of 1:1½; 3 in accordance with Section 123 may be increased 20 per cent in excess of the above stresses.

SECTION 129. **General Assumptions.** As a basis for calculating the strength of beams and slabs, the following assumptions shall be made:

(a) A plane section before bending remains plane after bending.

(b) The modulus of elasticity of concrete in compression remains constant within limits of working stresses fixed in this Code.

(c) The adhesion between concrete and reinforcement is perfect.

(d) Concrete has no value in resistance to tension.

(e) Initial stress in the reinforcement due to contraction or expansion in the concrete is negligible.

(f) The ratio of the moduli of elasticity of 1:2:4 stone or gravel concrete and steel inflexure shall be taken as 1:15.

(g) The ratio of the moduli of elasticity of 1:1½:3 stone or gravel concrete and steel inflexure shall be taken as 1:12.

The span length for beams and slabs shall be taken as the distance from center to center of supports, but need not be taken to exceed the clear span plus the overall depth of beam or slab. Brackets shall not be considered as reducing the clear span in the sense here intended.

BENDING MOMENTS OF UNIFORMLY LOADED FLOOR AND ROOF SLABS

SECTION 130. **Bending Moments Of Slabs Supported On Two Sides.** The bending moments of slabs due to uniformly distributed loads shall be taken as not less than:

1-8 WL, at center when simply supported.

1-10 WL, at center and continuous support when supported at one end and continuous at the other.

1-12 WL, at center and intermediate supports when continuous over more than two supports.

W—Total distributed dead and live loads.
L—Length of span in feet.
l—Length of span in inches.

SECTION 131. **Bending Moments Of Slabs Supported On Four Sides.** The bending moments of uniformly loaded slabs supported on four sides and reinforced in both directions shall be taken as:

1-8 WL, at center in each direction when simply supported.

1-10 WL, at center and continuous support when continuous over one support.

1-12 WL, at both center and supports when continuous over two or more supports.

SECTION 132. **Distribution Of Loads.** The distribution of loads on square and rectangular slabs supported on four sides, shall be determined by the following formula.

$$r \quad \frac{l^4}{l^4 \textit{ plus } b^4}$$

in which r—the proportion of the load supported by the transverse reinforcement.

l—Length of slab.
b—Breadth of slab.

If the length of the slab exceeds 1½ times its width, the transverse reinforcement shall be designed to carry the entire load.

For various ratios of the l-b the values of r are as follows:

l-b	r
1	0.50
1.1	0.59
1.2	0.67
1.3	0.75
1.4	0.80

BENDING MOMENTS OF UNIFORMLY LOADED BEAMS AND GIRDERS

SECTION 133. **Beams With Simple Or Continuous Supports.** The bending moments of uniformly loaded beams shall be taken as:

1-8 WL. at center when simply supported.

1-10 WL. at center and over continuous support when supported at one end and continuous at the other.

1-12 WL. at both center and supports when continuous over more than two supports.

SECTION 134. **Beams Supporting Rectangular Slabs.** 1 Beams supporting rectangular slabs reinforced in both directions, shall be assumed to take the proportions of load as determined by the formula in Section 132.

2. The bending moments of slabs, beams or girders which are continuous for two spans only, shall be taken as 1-8 WL over the central support and 1-10 WL near the middle of the span.

GENERAL DESIGN REQUIREMENTS FOR BEAM AND SLAB CONSTRUCTION

SECTION 135. **Special Members.** The bending moments for slabs or beams with spans of unusual length or due to other than uniformly distributed loads, shall be more exactly computed according to accepted theory.

SECTION 136. **Continuous Floor Construction.** In continuous slabs, beams or girders, full provision shall be made for the negative bending moments over the supports by placing sufficient negative reinforcement near the top of the members to resist the stress. This reinforcement shall pass beyond the point of inflection in beams or girders and be anchored in the compression concrete of the member a sufficient distance to develop the full strength of the steel through bond stress. The critical section of continuous construction is over the support.

SECTION 137. **Web Reinforcement In Beams.** 1 Members of web reinforcement in beams shall be designed for diagonal tensile stresses, using the calculated vertical shearing stress as a measure of these tensile stresses. They shall not be spaced to exceed three fourths of the depth of the beam in that portion where the web stresses exceed the allowable value of the concrete in shear. It shall be assumed that two-thirds of the external vertical shear is provided for by the steel in calculating the stresses in stirrups, diagonal web members, and bent up bars; and the remaining one-third of the shear shall be assumed as taken by the concrete, in accordance with Section 128.

2. Web members such as stirrups, when not rigidly attached to the longitudinal steel at both top and bottom, shall be carried around and bent over the longitudinal members or otherwise sufficiently anchored in the compression concrete to develop the tensile stresses existing in them. Diagonal members shall be rigidly attached to the longitudinal steel on the tension side. Stirrups at the ends of continuous girders shall be inverted with the free ends anchored in the compression concrete at the bottom of the beam. The length of stirrups or diagonals embedded in compression concrete shall be sufficient to develop their entire tensile stresses by adhesion.

SECTION 138. **T Beams.** 1 Where adequate bond is provided at junction between slab and beam, and the two are cast at the same time as a unit, the slab may be considered as an integral part of the beam, provided its effective width shall not exceed on either side of the beam one-sixth of the span length of the beam, not be greater than four times the thickness of the slab on either side of the beam; the measurements being taken from line of intersection between slab and beam.

2. In beams with T sections the width of the stem only shall be used in calculating longitudinal shear and diagonal tension. An effective bond shall be provided at the junction of the beam and slab when the principal slab reinforcement is parallel to the beam, by the use of transverse reinforcement extending over the beam and well into the slab.

3. In the design of T beams acting as continuous beams, sufficient compression area shall be provided on the under side at the support, either by the use of properly designed brackets or by embedding additional compression steel in the concrete extending to the point of inflection.

SECTION 139. **Minimum Thickness Of Slabs.** The minimum thickness of concrete floor slabs shall be 4 inches, and for roof slabs $3\frac{1}{2}$ inches, unless especially designed for the use of an approved specific type of reinforcement continuous in both directions.

SECTION 140. **Floor Finish.** Cement or concrete floor finish shall not be considered in calculating the strength of floor members unless it be laid at the same time they are cast.

SECTION 141. **Composite Floors.** The design of composite floors consisting of rows of hard-burned terra cotta tile, concrete blocks, sheet steel, or other approved fire resistive material, separated by ribs or beams of reinforced stone or gravel concrete, shall conform to all the provisions of this part so far as they are applicable. The ribs shall be at least 4 inches wide. The tile or blocks shall be regarded only as fillers, and shall be considered in the design only as dead load. If designed as a T-beam, the slab portion above the fillers shall be at least $2\frac{1}{2}$ inches thick, and shall consist of the same mixture used for the ribs, and shall be cast at the same time; under these conditions it may be considered in the design of the ribs. Tile or concrete block fillers shall be laid with Portland cement mortar joints, and shall be thoroughly wet before the concrete is poured. The protection for steel bars in bottom of ribs shall be the same as for other beams.

To resist expansion stresses, reinforcement bars not less than 3-8 inch diameter, shall be placed in the concrete at right angles to the ribs and above the fillers, at intervals not exceeding 30 inches, unless the reinforcement used is designed to provide for ample temperature stresses and meets the approval of the Building Inspector.

DESIGN OF COLUMNS AND WALLS

SECTION 142. **Length Of Columns.** The length of columns shall be taken as the maximum unsupported length. The unsupported length of columns shall not exceed fifteen times the least side or diameter, and in no case shall the least side or diameter be less than 12 inches. The length shall include any corbel or knee brace attached to the column.

SECTION 143. **Columns Without Hoops.** Axial compression in reinforced concrete columns without hoops, bands, or spirals, containing not less than ½ per cent nor more than 3 per cent of vertical reinforcement, secured against lateral displacement by steel ties placed not farther apart than fifteen diameters of the vertical rods, nor more than 12 inches, shall not exceed 500 pounds per square inch on the effective area of the concrete, plus 6000 pounds per square inch on the vertical reinforcement. The percentage of reinforcement shall be calculated upon the effective area of the column, which is the area within the reinforcement. Steel ties shall be not less than 1/4 inch in diameter or least dimension. At least four vertical bars shall be used in every reinforced column, and no bar shall have an area of less than 1/4 square inch.

SECTION 144. **Columns With Hoops.** Axial compression in reinforced concrete columns with not less than 1 per cent of hoops or spirals (that is, a volume of steel equal to 1 per cent of the volume of concrete within the hoops or spirals for a unit length of column) spaced not farther apart than one-sixth of the diameter of enclosed column, but in no case more than 3 inches, with not less than one nor more than 4 per cent of vertical reinforcement, shall not exceed 750 pounds per square inch on the effective area of the concrete, plus 9000 pounds per square inch on the vertical reinforcement. The hoops or spirals shall be uniformly spaced, and shall be rigidly attached to at least four vertical bars in each convolution.

SECTION 145. **Structural Steel And Concrete Columns.** Axial compression in structural steel columns thoroughly encased in concrete having a minimum thickness of 4 inches and reinforced with not less than 1 per cent of steel (that is, a volume of steel equal to 1 per cent of the volume of concrete within the hoops) equally divided between vertical reinforcement and hoops or spirals spaced not more than 12 inches apart, may be taken at 16,000 pounds per square inch on the net section of the structural steel, no allowance being made for the concrete casing. The hoops or spirals shall be placed not nearer than 1 inch from the structural steel, or nearer than 1 1/2 inches from the outer surface of the concrete. The ratio of length to least radius of gyration of the structural steel section shall not exceed 120.

SECTION 146. **Columns Constructed With Special Concrete.** In reinforced concrete columns the compression on the concrete may be increased 20 per cent when the fine and coarse aggregates are carefully selected, and the proportion of cement to total aggregates increased to one part of cement to not more than four and one-half parts of aggregate, fine and coarse, either in proportion of one part of cement one and one-haif parts of sand and three parts of stone or gravel, or in such proportions as will secure the maximum density. The unit stress on the vertical reinforcement in such columns shall not exceed twelve times the unit stress on the concrete.

SECTION 147. **Columns Eccentrically Loaded.** Bending stresses in columns due to eccentric loads, shall be provided for by increasing the section of concrete or steel so that the total unit stress shall not exceed the allowable working stress in flexure.

SECTION 148. **Steel Base Plates.** Suitable steel base plates or castings shall be provided at the bottom of columns to distribute the loads over the footings, and the vertical reinforcement bars shall bear squarely on these plates, or the reinforcing bars shall be carried down into an enlarged footing to distribute the load through bond stress.

SECTION 149. **Walls.** Exterior and interior bearing and non-bearing walls of reinforced concrete shall be securely anchored to all intersecting walls, columns, and floors, and the allowable compressive stress shall not exceed 250 pounds per square inch. The thickness shall be not less than two-thirds that specified for brick walls and in no case less than 6 inches. All such walls shall be reinforced with steel running both horizontally and vertically. The amount of reinforcement shall be not less than 1-5 of one per cent of the cross-section of the wall required for strength, and shall be equally disposed near each face of the wall; except that in walls or partitions 8 inches or less in thickness, the reinforcement may be placed as a single layer in the middle. Reinforcement shall not be spaced more than 18 inches apart. Additional reinforcement shall be placed around wall openings, and all vertical and horizontal reinforcement shall be wired or have other mechanical bond at intervals not exceeding 18 by 30 inches in either direction. Expansion rods shall not exceed 30 inches center to center.

Reinforced concrete partitions, Sections 67 and 118.

GENERAL PROVISIONS FOR DESIGN OF GIRDERLESS FLOORS OR FLAT SLABS

SECTION 150. **Girderless Floors.** 1. Girderless floors or flat slabs consisting of reinforced concrete slabs resting upon columns with flaring heads, with or without drop heads or column caps, and in which no beams or girders are used, except around openings in the floor or along walls, shall be designed in accordance with the bending moment coefficients and stresses specified in this Code. No empirical formulas based on the results of tests shall be permitted, but the design shall in general be based upon the principles of continuous or cantilever construction as herein indicated.

2. The methods of analysis shall be as follows:

(a) The portion of the slab adjacent to the column shall be considered as a circular plate supported at the center forming the cantilever portion. The remainder of the slab shall be considered as a simply supported portion suspended from the cantilever plates. The cantilever portion shall be designed for a uniform load over its area equal to the live and dead load on that area plus a concentrated load on its perimeter equal to the floor load resting on the suspended portion of the slab. The radius of the cantilever plate shall be the average distance from the center of the column to the points of inflection of the slab.

(b) Or the slab may be considered as consisting of a series of continuous broad, flat, girders reinforced with bands of steel consisting of rods supported at the top of the slab over the columns and depressed to the bottom of the slab at the center of the span. These bands of reinforcement may be arranged to run in two directions directly from column center to column center; or in four directions, the former bands being combined with reinforcement running diagonally from column to column.

SECTION 151. **Columns For Girderless Floors.** 1. The column capital shall have a diameter or least side at the top in no case less than 0.225 L where L is the length of side of the square equivalent to the area of the rectangle included between four adjacent columns. The thickness of the column capital at this diameter shall be not less than 1¼ inches. The slope of the column capital shall nowhere exceed an angle of 45 degrees with the vertical.

2. A depressed head or "drop" may be cast above the column capital and the dimensions of this cap

shall be not less than 0.4 of the side of the equivalent square panel.

3. The point of inflection shall be assumed $\frac{1}{6}\sqrt{3L}$ from the center of the column.

4. The width of bands shall be such as to properly cover the panel area, but shall not be wider than 0.4 times the side of the square panel. Where steel is provided in two directions only, the central portion of the panel shall be considered as a slab supported on four sides.

5. Punching shear shall be calculated at the edge of the column shaft and shall not exceed 120 lbs. per sq. inch. In computing shearing stress for the purpose of determining resistance to diagonal tension, a point shall be taken at a distance out from the column capital equal to the effective depth of the slab.

6. Working stresses and coefficients shall in general comply with Sections 128, 130 and 134 of this Code. In rectangular panels, the long dimension shall not be more than four thirds times the short dimension. Interior columns shall be capable of resisting the unbalanced bending moment produced by a panel with live load adjacent to a panel without live load. Floor slabs at walls shall be considered as simply supported on walls or wall beams. If the proportion of the slab adjacent to a wall column is assumed as a cantilever, the wall column or pier shall be capable or resisting the unbalanced moment produced by such cantilever. Bars for quarter point of the span, and if the bars have a greater diameter than ¾ inch, special attention shall be given to bond and anchorage.

REQUIREMENTS FOR REINFORCEMENT

SECTION 152. **External And Internal Defects.** All reinforcement shall be free from excessive rust, scale, grease, paint or any coating which would tend to reduce or destroy the bond between the steel and the concrete. Bars shall also be free from injurious seams, slivers, flaws, and other mill defects. The weight of any lot of bars shall not vary more than 5 per cent from the standard weight of the lot as given by manufacturers' handbooks.

SECTION 153. **Placing And Spacing Of Reinforcement.** All reinforcement shall be accurately located and mechanically secured against displacement during the placing of the concrete. Reinforcement bars for slabs shall not be spaced farther apart than two and one-half times the thickness of the slab. The spacing of parallel bars in beams shall be not less than three diameters from center to center, nor less than one inch. The clear spacing between two layers of bars shall be not less than one inch. In restrained or cantilever construction reinforcement shall extend beyond the supports into adjacent construction for full and effective anchorage, except that when this is not practicable, anchorage shall be obtained by other means acceptable to the Building Inspector. Special reinforcement shall be provided to resist concentrated loads. Slabs reinforced in one direction only, shall have shrinkage rods not less than $^1/_4$ inch in diameter placed above the reinforcement and spaced not over 2 feet 6 inches apart. All reinforcement shall be assembled well in advance of the placing of the concrete and shall be inspected and approved by the Building Inspector before concrete is deposited.

SECTION 154. **Protection For Reinforcement.** Steel reinforcement shall have a minimum protection of concrete on all sides as follows:

In columns and girders, 2 inches; in beams and walls, 1$^1/_2$ inches; and in floor slabs, $^3/_4$ inch.

The steel in footings for walls and columns shall have a minimum protection of 3 inches of concrete.

SECTION 155. **Splices In Reinforcement.** Splices in reinforcing bars shall be designed to transfer the calculated stress at the joint either by bond and shear through the concrete, or by bearing between the steel. Splices at points of maximum stress shall be avoided where possible. Lap splices of bars shall be of sufficient length to develop the required stress in the joint without exceeding the bond stress permitted. In columns where necessary to splice vertical bars having areas in excess of 1$^1/_4$ sq. inches, it shall be done by cutting the bars squarely at the ends and enclosing them in a close-fitting pipe sleeve, or uniting them by a threaded splice or other mechanical connection that will transfer the load from one to the other without stressing the adjoining concrete excessively.

The middle point of such splices shall be within one foot above the floor level. Splices in column hooping where necessary, shall be sufficient to develop the full strength of the hooping.

WORKMANSHIP FOR CONCRETE

SECTION 156. **Mixing.** 1. The separate ingredients of concrete shall be accurately measured, and thoroughly mixed in a manner to produce a homogenous mass of uniform color and of such a viscous consistency that it will flow to all parts of the forms without separation of the coarse aggregate from the mortar.

2. Except when limited quantities are required, or when the conditions of the work make hand mixing preferable, mixing shall be done in a mechanical batch mixer from which a complete batch shall be discharged before another is received. All ingredients shall be mixed together for at least one minute, the mixer making at least 20 revolutions. The speed of the mixer shall not exceed 20 revolutions per minute. In all cases, the mixing shall be continued until the consistency is constant.

SECTION 157. **Depositing.** 1. Concrete shall be deposited, thoroughly tamped and worked to place before initial set begins, and shall then be kept free from shocks and disturbances of every kind until it has fully hardened. Retempering of concrete after its initial set shall be prohibited.

2. When the work of placing concrete is suspended, all necessary grooves for joining future work shall be made before the concrete sets.

3. Before depositing new concrete upon concrete already set, the contact surfaces shall be roughened, cleaned of all laitance, and loose material, and then drenched with water and slushed with a grout consisting of one part Portland cement and not more than two parts fine aggregate immediately before placing the fresh concrete. If a watertight joint is desired, or if granolithic is to be deposited on old concrete, it is necessary that a neat cement grout be used.

SECTION 158. **Drying And Freezing.** 1. When fresh concrete is exposed to rapid drying conditions, precautions shall be taken to keep it moist for a period of at least seven days after being deposited. Where practical this shall be done by a covering of wet sand, burlap or some other equally effective method. Thorough wetting twice a day is recommended.

2. In freezing weather all materials used in making concrete, particularly the coarse aggregate, shall be heated, and precautions shall be taken to prevent the concrete freezing while being deposited, and thereafter it shall be kept above 40 degrees until the concrete has obtained its final set, but such period shall be not less than 72 hours.

SECTION 159. **Joints.** 1. Construction joints shall be avoided wherever practicable, but when they are necessary they shall be located at such sections as will least affect the structural strength and shall be made at right angles to the direction of principal conpressive stress. In members of floor systems, joints shall be made within the middle third of the span where practicable. In columns, joints shall only be permitted at the bottom face of the lowest connecting floor members. Temperature changes and shrinkage during setting necessitate joints in independent walls at intervals of 50 to 80 feet when not otherwise provided for by effective reinforcement.

2. Girders, beams, and slabs shall not be cast upon freshly formed columns until a period of 4 to 6 hours have elapsed to permit settlement.

SECTION 160. **Construction Of Forms.** 1. Forms shall be substantial and unyielding, and care shall be exercised to make them as nearly water-tight as practicable.

2. Care shall be taken to insure that all debris is removed from forms, and that they are thoroughly greased or wetted before concrete is deposited in them. Beam forms shall be so designed that at least one side may be removed without disturbing the bottom portion of the forms and its supports; and column forms, so that they may be removed without disturbing beam and slab forms. Cleanout holes shall be provided in the bottom of column forms where necessary to insure the removal of wood chips or other debris.

SECTION 161. **Removal Of Forms.** 1. The time for the removal of forms shall always be subject to the approval of the Building Inspector.

SCHEDULE

Bottom of slabs, spans of 6 feet plus 1 day extra for each additional foot of span	4 days
Bottom of beams and girders of ordinary length	14 days
Beams of span of 20 feet	21 days
Sides of lintels, girders and beams	3 days
Columns	3 days
Thin walls	3 days

2. Girders of 25-foot span or over shall be considered as special cases and shall be subject to the inspection of the Building Inspector before removal of the supports.

3. Composite floors, same as for ordinary beams.

4. All reinforced concrete shall be carefully in-

spected to insure its soundness and reliability before main supports are removed.

5. No loads shall be placed upon a reinforced concrete floor before the removal of the form supports, which would in any way tend to overstress such supports or those below.

6. Special care shall be observed in removing forms when the concreting has been done in cold weather. Concrete which has frozen accidentally before setting, shall be thawed and kept thawed until it is determined whether the cement will set. In this case, sufficient water shall be provided for the cement to hydrate during this action.

SECTION 162. **General Requirements For Tests.** All tests upon reinforced concrete materials or construction, shall be made in accordance with the requirements of Section 45.

SECTION 163. **Inspection.** Every reinforced concrete biulding shall be erected under the constant supervision of a reputable and competent inspector furnished by the owner or architect. It shall be the duty of the inspector to keep a daily record of the work done, to observe whether the materials employed, and the methods of construction are in all respects in accord with the specifications filed with the superintendent and the requirements of this Code, and to make record of all variations therefrom.

REINFORCED CONCRETE FOR FIREPROOFING

SECTION 164. **Approved Construction.** 1. Concrete is approved for all fire-resistive construction, also for the protection of steel structural members, or for any other fire-proofing purposes in any building.

2. Any system of reinforced concrete construction may be approved for the construction of floor or roof panels, or partitions in skeleton frame or any other type of fire-resistive building, provided that the unit stresses in the materials do not exceed those specified in this Code as permissible for use in such design; and that the concrete and the construction conform to the various other requirements herein specified for such use, including the fire test.

SECTION 165. **Mixture.** Concrete for fireproofing purposes shall consist of a mixture of viscous consistency of one part Portland cement to not more than seven parts of fine and coarse aggregate by volume. The aggregate shall be mixed in the ratio of two parts of fine to not more than five parts of coarse, or in such proportions as will give the densest mixture.

SECTION 166. **Aggregates.** Fine aggregates shall be of quality described in Section 125.

Coarse aggregates shall consist of gravel, crushed stone, hard burned brick, terra cotta, slag, or steam boiler cinders, and shall be clean, hard, and free from deleterious material. All aggregates shall be sized to pass a 1 inch screen and be retained upon a $^1{}_4$ inch screen, and shall be reasonably dry when screened.

SECTION 167. **Manipulation.** Concrete for fireproofing shall be mixed, deposited, and protected in accordance with the requirements of Sections 156 to 161 of this Code.

SECTION 168. **Reinforcement.** 1. The steel reinforcement in concrete used for fireproofing, shall be of quality required by Section 127, and the installation shall be in accordance with the specifications of Section 153. The longitudinal members in mesh reinforcement shall not be spaced more than 4 inches center to center, and the least dimension of mesh opening shall be 2 inches. Mesh metal fabrics of all kinds shall have a slide lap of not less than 3 inches.

2. All reinforcement essential to secure the required strength of arches or slabs, shall be fully embedded in the concrete, and shall have a protection of at least $^3{}_4$ inch of concrete on the under side.

3. Exposed metal centering or exposed metal of any kind shall not be considered a factor in the strength of any part of any concrete construction subject to fire; and a plaster finish applied over the metal shall not be accepted as sufficient protection.

SECTION 169. **Cinder Concrete.** 1. Cinder concrete may be used constructively as fireproofing, only for floors and roofs between steel beams, and for interior non-bearing walls or partitions.

2. Cinders shall be composed of hard, well burned, vitreous cinder, free from sulphides, fine ashes and foreign matter. The use of gas-house, or locomotive cinders, or stove or heating furnace ashes, is prohibited.

3. In the selection of cinders for concrete, care shall be exercised to insure that they carry only a small percentage of unburned coal or coke. The amount shall not exceed 15 per cent.

4. Cinder concrete in the proportions of 1:2:5 to

qualify for use for fireproofing, except when used as fill above the floor arch proper, shall develop an average crushing strength of not less than 800 pounds per sq. inch at 28 days, when tested in accordance with the method of test prescribed for stone concrete in Sections 45 and 123.

5. The allowable extreme fibre stress in compression in cinder concrete slabs between steel beams shall not exceed 300 pounds per sq. inch. The ratio of the moduli of elasticity of 1:2:5 cinder concrete and steel shall be taken as 1 to 30.

SECTION 170. **Design Factors For Special Concrete.** The allowable working stresses and moduli of elasticity for concrete composed of aggregates other than stone, gravel, or cinders, shall be determined by the Building Inspector from the results of actual tests.

SECTION 171. **Floor Systems Approved On Design.** 1. Segmental concrete arches or flat slabs shall be approved for fireproofing if designed and constructed in accordance with the requirements of Parts XIX insofar as they are applicable; but the permissible stresses for cinder concrete shall be taken as specified in Section 169.

2. The span of concrete arches or slabs for fireproofing, shall be taken as the distance center to center of the supporting steel beams, and shall not exceed 8 feet unless the coarse aggregate in the concrete be either stone, or gravel, in which case the span shall be limited by the design.

3. The minimum thickness of arches or slabs of cinder concrete for floor and roof construction, shall be 3½ inches, and in no case less than one eighteenth of the span length between supporting beams.

SECTION 172. **Concrete For Principal Bearing Members.** Except by written permit of the Building Inspector, the coarse aggregate in all concrete used in the construction of bearing walls, columns, piers, or girders, shall be stone or gravel.

SECTION 173. **Tie Rods.** 1. Segmental arches shall have a rise of not less than ¾ inch per foot of span, and steel tie rods of proper size, spacing, and location to resist the thrust shall be used. The rods shall be protected as required in Section 114, Paragraph 2.

2. In flat arches, if tie rods are omitted, the reinforcement shall be continuous, or the ends of the bars

shall be hooked over the beams or otherwise securely fastened to them at intervals not exceeding 3 feet.

SECTION 174. **Concrete Fill.** Concrete for fill shall consist of one part cement and not more than ten parts of aggregate. Aggregates shall be as specified in Section 166. All concrete fill shall be well mixed, thoroughly wet, tamped to place, and brought to a level at the required height. See section 113, Paragraph 2.

SECTION 175. **Protection For Steel Structural Members.** Concrete used as fireproofing upon structural steel members shall have the quality, thickness, and be anchored as specified in Section 115.

PART XX.

STANDARD MILL "SLOW BURNING" CONSTRUCTION (SEE NATIONAL CODE PAMPHLET)

PART XXI.

FIRE AND STRENGTH TESTS

FIRE TESTS OF CONSTRUCTION

SECTION 176. **Specifications for Fire Tests.** 1. None but approved materials or methods of construction shall be used in the erection of fireproof buildings.

2. Fireproof construction and protective devices to qualify for use under test, shall meet the requirements of the following specifications to the satisfaction of the Building Inspector.

3. Fire Test for Floors. The fire test for floors shall be made on at least one full size span, and shall be continuous for four hours at an average temperature of 1700 degrees F. In this and all other respects the floor to be tested shall meet the requirements of the current specifications of the Standard Test for Fireproof Floor Construction prescribed by the American Society for Testing Materials; or the specifications for such test employed at the Laboratories of the National Board of Fire Underwriters.

4. Fire test for Partitions. The fire test for partitions other than those used for shaft enclosures, shall be continuous for two hours, the temperature rising to 1700 degrees F. in one-half hour, and averaging 1700 degrees F. for the balance of the tests. In this and all other respects the partition to be tested shall meet the requirements of the current specifications of the Stand-

ard Test for Fireproof Partition Construction prescribed by the American Society for Testing Materials, or the specifications for such test employed at the Laboratories of the National Board of Fire Underwriters.

5. Fire Test For Stair And Elevator Shaft Partitions. The fire test for partitions used to enclose stair, elevator and other shafts shall be continuous for three hours with an average temperature of 1700 degrees F., for the last two and one-half hours of the tests, and shall in all other respects conform to the requirements of the test for partitions given in paragraph 4 of this section.

6. Fire Test For Doors And Shutters. The size of test sample shall conform to the dimensions required for the maximum size of wall opening for which the device is designed up to and including 5 feet by 7 feet, and shall be mounted and hung in every respect as for ordinary service. It shall be subjected to a continuous fire upon one side for at least one hour, the temperature increasing to 1800 degrees F. within 30 minutes, and then rising gradually to a final temperature of 2000 degrees at the end of the hour.

Immediately after the expiration of the fire test, while the door is still red hot it shall be subjected to a stream of water from a 7-8 inch nozzle 20 feet distant from the door and under a pressure of 60 pounds per square inch at the nozzle. The stream shall be kept moving over a test sample for one minute.

A door to successfully pass this test shall not develop serious structural weakness, shall prevent the development of flame on the unexposed side of the door which extends more than a few inches from the door surface; the heat transmitted through or round the door shall not be sufficient to ignite burlap or similar combustible material placed 36 inches back from the door in a room surrounding the unexposed side of the door.

7. Fire Test For Windows. The size of the test sample and the character of the test shall be the same as that prescribed for doors, except that the temperature shall rise gradually throughout the test to a maximum of 1500 degrees F. at the end. The application of water shall be the same as for doors. A test to be successful shall meet the requirements specified for doors, as to structural weakness and passage of flame, but no restriction shall be made as to the amount of heat transmitted through the window; furthermore small portions of glass dislodged by application of the stream of water shall not be considered as structural weakness.

The size of wired glass panel in either window or door shall not exceed 720 square inches.

8. Fire Test For Approved Fire-Resisting Roofing. The roofing shall at least withstand the attack of burning fire brands for 5 minues with a wind pressure of 5 miles per hour, without ignition of a clear dry white pine decking beneath it; and shall not crack and expose the decking, nor slip badly, nor convey or communicate fire badly, nor produce a serious flying-brand hazard when thus exposed. The test shall be made with the sample at the maximum angle of inclination advocated in practice. The brands shall consist of at least ten strips of seasoned hard maple 2 inches square and 3 feet long, formed into a frame or grid with a 1¾ inch space between them. The complete grid shall be thoroughly ignited and burning before application to the roof sample, which latter shall exend on all sides at least 18 inches beyond the edges of the grid.

9. Other Materials and Construction. The fire resisting properties of any material or construction other than those already described in this section shall be determined by such tests as meet the approval of the Building Inspector.

SECTION 177. **Strength Test For Floor Construction.** Test of Sample Floor Panel. 1. Any system of fireproof floor construction intended for use between steel beams which is not susceptible of analysis and computation according to the rules of design, may receive approvaal for use for spans not exceeding 8 feet, on the basis of an ultimate load test as follows:

2. The test shall be under the direction of the Building Inspector and shall be made upon a section of flooring not less than 4 feet wide, and of a span corresponding to the proposed construction. The test load shall be applied at points or leading areas located at the third points of the span. Each loading area shall consist of a zone of the slab surface not exceeding 1 foot in width, and of a length corresponding to the width of the test slab. Rigidity of the steel framework may be secured in any manner acceptable to the Building Inspector, but in all cases one end of the test panel shall be constructed to reproduce the conditions of an outside or end panel in a building.

A loose sand bed not over one inch thick may be provided between the floor and the load. Approved methods shall be used for applying the test load and measuring the deformations. The load shall be applied gradually, and a complete record of loads and deformations shall be kept throughout the test. The allowable working load shall be one-sixth the total load causing failure, thus providing for a factor of safety of approximately eight on the basis of a uniformly distributed load.

3. The Building Inspector shall keep record of all details of test construction, and approved constructions shall thereafter be installed in every respect in accordance with said record.

4. The application of a test load to a segmental arch may vary from the method given in paragraph 2 if necessary, but any change shall be approved by the Building Inspector, and care shall be taken to avoid possibility of arching in the load.

5. If for reasons stated in paragraph 1 a floor panel composed of cinder concrete, or concrete made from other fireproofing materials, is entitled to a test for approval; or if the methods or results of calculation for such a floor system are unsatisfactory to the Building Inspector, he may require a confirmation test. In either case the test shall be applied in the manner stated in paragraph 2, except that if the system is installed in practice with both ends of the floor panel freely supported, it shall be so tested; if installed in practice with both ends of the reinforcement securely anchored to the supporting beams, it shall be so tested. In each case an adjoining span may be built at one end of the same length and thickness as the test span. If the reinforcement consists of wire mesh or similar material installed by laying the mesh continuously over the supporting beams, it shall be considered as a condition affording only partial restraint, and the test construction shall be installed as follows: One end of the test section shall be freely supported on the steel beam, and the other end made continuous by installing a span equal to the test span in length and thickness, and embedding the reinforcement therein in the usual manner.

Test construction shall be 30 days old on the day of the test.

SECTION 178. **Test Of Systems Of Construction.** When a construction engineer, contractor, or builder proposes new methods or principles in combining concrete, steel or other structural materials, not provided for by this Code; or designs a construction in which the stresses are indeterminate, he shall furnish for record with the Building Inspector, plans and specifications giving in detail the construction and calculations, used in his design. He shall also prepare a sample portion of the construction and submit it to an ultimate load test in a manner satisfactory to the Building Inspector; or the Building Inspector may accept satisfactory evidence that such test has been made upon the particular system proposed. Such evidence shall comprise full details of a test and the results, and shall show the deflections and other effects on the construction at all steps during the test. If the test shows that the construction, based on specifications submitted, has a factor of safety of four on total dead and live load, and that the design, stresses, and coefficients specified by this Code are not exceeded, and it otherwise meets the approval of the Building Inspector, he shall issue regulations under which such construction may be used. No such regulations, however, shall have the effect of altering the working stresses and the requirements for fireproofing specified in this Code.

SECTION 179. **Test Of Workmanship For Floor Construction.** 1. Whenever the Building Inspector has doubt as to quality of materials or workmanship in any building, he may require the owner or contractor at his own expense to make such test as will establish the safety of the construction before certificate of occupancy is issued.

2. The test shall be under the direction of the Building Inspector, and shall show that the construction will safely sustain, a load equal to twice the live load for which it was designed, for a period of 24 hours without injury or permanent deformation. In the test of a floor arch the load shall be applied to a typical arch of average span between beams. If less than a whole arch between girders is tested, the test section shall be cut apart or isolated from the rest of the arch before applying the load; such test section shall have a width of at least 4 feet measuring parallel to the beams.

3. The load shall consist of such materials and shall be so placed as to form a uniformly distributed load over the entire area to be tested without arching effect. In case sand or similar material is used for loading, it shall be loose in bottomless bins, and not in sacks or packages of any kind. A complete record of loads and deformations shall be kept throughout the test.

4. At least 30 days shall have elapsed after removal of forms from concrete flooring before a test load is applied.

5. If the portion tested should fail to meet the requirements of this test, the Building Inspector may still approve the structure for use, and if necessary tests shall be repeated on different portions to determine the critical load. The detail records of this test, and the results of the tests upon the samples of concrete used in the construction, shall be taken into consideration by the Building Inspector in determining the working load to be permitted. However, it shall not be accepted by the Building Inspector, if in his judgment it is sufficiently defective to be unsafe for the purpose intended.

THEATRES, MOVING PICTURE THEATRES AND ASSEMBLY HALLS

PART XXII.

SECTION 180. **Arrangement of Building.** No person, persons, firm company or corporation shall operate, conduct, or maintain any theatre or moving picture show or mechanical show of any kind, within the City of Astoria, without complying with the provisions of this Code.

2. Sufficient and adequate means of exit and egress shall be provided and be lighted with proper exit signs, such exit signs to be so lighted and so placed, as to be easily discernible by the persons attending such theatre, moving picture or mechanical show.

3. There shall be not less than two exits provided for a seating capacity of two hundred and fifty persons or more and each of such exits shall be not less than five feet in width, and for a seating capacity of less than two hundred and fifty persons there shall be two exits provided and each of such exits shall be not less than two and a half feet wide and in either case one of said exits shall be a side or rear exit, and in the event of a side exit, shall be back from front, not less than one quarter of the distance between the front and rear walls of the room, and if opening on to a passageway, said passageway shall be not less than three and a half feet wide and lead directly to the street.

4. The passageways referred to in the previous paragraph shall be sufficiently lighted from the exit of such theatre, moving picture or mechanical show to the street, so that persons having occasion to use the same can easily see the passage to the street from the exit thereof.

5. All exit doors or openings in this ordinance provided for, and all doors of such places, herein referred to, shall swing or open outward.

6. No theatre, moving picture or mechanical show shall allow or permit any persons whatsoever, excepting actors and regular employees therein, to stand in, or remain in, the aisles, lobby or other portion of such place while a performance or show is being given in such place.

7. All such theatres, moving picture or mechanical shows shall be properly, sufficiently and adequately ventilated, either by means of electric fans, or openings for that purpose, either at the sides or at the ceilings of such places, in such a manner that there shall be a constant and free circulation of pure air therein, and further, that all foul air is removed by the system or manner of ventilation provided therein.

8. That every such theatre, moving picture or mechanical show shall have two aisles running the entire length thereof, each of said aisles to be at least three feet in width.

9. At each exit, as provided for herein, and at each door of such theatre, mechanical or moving picture show, and immediately adjoining and in front of such exit or door, there shall be a free, open, clear and unobstructed space, at least the width of such exit or door, and running back eight feet into the interior of such place.

10. That it shall be the duty of the Chief of the Fire Department of the City of Astoria, or any fireman, of the City Fire Department whom he shall designate in writing for that purpose, at least once in every week or as often as he shall deem necessary, to inspect all theatres, moving picture or mechanical shows, conducted, operated or maintained in the City of Astoria to see whether the regulations of this Code are being enforced; that such inspections may be made during the progress of a performance in such places; that for the purpose of such inspections, as herein set forth, the Chief of the Fire Department or such fireman as he shall designate, as above set forth, shall have access upon demand therefor, to such theatres, moving picture or mechanical shows; that said chief or firemen shall report any violations of this ordinance to the City Attorney who shall prosecute the same.

11. That two convictions of the violation of this Code, as hereinafter provided for, shall constitute a forfeiture of the license issued to a person, persons, firm, company or corporation to operate, conduct or maintain such theatre, moving picture or mechanical show.

12. That the person in charge of such theat

moving picture or mechanical show, shall be required and charged with the duty of observing and fulfilling the provisions of this Code, and shall, for all intents and purposes, so far as this Code is concerned, be considered, in event of the breach of any provisions of this ordinance to be the violator thereof, and shall be punished, as hereinafter provided for.

SECTION 181. **Regulations In The Use Of Aisles And Passageways And Stairways In Theatres And Public Halls.** 1. It shall be unlawful for the owner, lessee, manager, or other person, firm or corporation, having charge of any theatre or public hall to permit any person, during a performance, exhibition, lecture, entertainment or public assembly therein, to sit or remain standing in any aisle, passageway, stairway or before any exit in or of such theatre or public hall.

2. It shall be unlawful for any person, during a performance, exhibition, lecture, entertainment, or public assembly, in any theatre, or public hall, to sit or remain standing in any aisle, passageway, or stairway or before any exit in or of such theatre or public hall.

3. Any person, owner, lessee, manager, or other person, firm, or corporation, violating any of the provisions of this Section shall be deemed guilty of a misdemeanor, and upon conviction thereof before the Municipal Judge, shall be punished as prescribed in Section 200.

SECTION 182. **The Obstruction Of Passageways Of Theatres And Places Of Public Assemblage Prohibited.** 1. It shall be unlawful for any person, firm or corporation, having control or management of any theatre, hall, concert hall, or other place of public assemblage to obstruct or cause to permit the obstruction of any exit, entrance, aisle, stairway, lobby or passageway thereof during any performance, exhibition, lecture, concert, or other public assemblage therein.

2. All sections or parts of sections in conflict with this section be and the same are hereby repealed.

3. Any person, firm, or corporation who shall violate any of the provisions of this Section shall be deemed guilty of a misdemeanor and upon conviction thereof, shall be punished as prescribed in Section 200.

SECTION 183. **Regulations In Regard To Installation Of Moving Picture Booths In Theatres And Moving Picture Establishments And Providing For Greater Safety To Life And Property By Regulating The Installation, Repair, Operation And Maintenance Of All**

Section 183

Moving Picture Theatres Or Establishments. 1. All moving picture machines must be located at the opposite end from the entrance. They may, however, be located over the entrance of the building if rear or side exit is provided.

2. All wiring, apparatus, etc., not specifically covered by special rules herein given must conform to the standard rules and requirements of the National Electric Code.

3. Arc lamp used as part of moving picture machine and dissolvers etc., must be constructed similar to arc lamps of theatres so far as practicable as specified by the National Electric Code and the wiring of same must not be less capacity than No. 6 B and S Gage copper wire.

4. Wiring must all be in approved, rigid or flexible conduit (this includes booth, auditorium, dressing rooms, or any part of moving picture theatres). See rule 38 N. E. C. Ed. 1911. Each picture machine, dissolver, flood or spot light must be wired as a 2-wire circuit, and a 2-pole switch and cut-out must cut off and protect the resistance and arc for every machine. All conduit must be brought to a point as near as possible to the arcs of the machines. Connections from arcs to conduit must be made with asbestos covered wire. Conduit must be rigidly supported in every case.

5. Rheostats or other necessary current reducing devices must be made entirely of non-combustible material, and of approved design, must be mounted on non-combustible support in such a manner that there will be an air space of at least 3 inches on all sides. The rheostat must be of enclosed design or be completely enclosed by a netting with a mesh not greater than ½ inch. When the resistance is not hung in operating room and the same is excessively hot, the same must be properly protected by asbestos. Wherever possible resistance would be suspended from the ceiling on straight insulators. When it is possible this resistance should be located outside booth.

6. Top and Bottom Reels must be enclosed in steel boxes or magazines, each with an opening of approved construction at bottom or top so arranged so as not to permit entrance of flame to magazine. No solder is to be used in the construction of these magazines. The front side of each magazine must consist of a door spring hinged and swinging horizontally and be provided with a substantial latch.

7. Automatic Shutter must be provided and must be so constructed as to shield the film from the beam of light whenever the film is not running at operating speed. Shutter must be permanently attached to the gate frame. In addition, a non-automatic shutter must be provided, placed in front of condenser so as to be readily closed by hand.

8. Extra films must be kept in individual metal boxes equipped with tight-fitting covers.

9. **Machine Operation.** Must be operated by hand, and motor driven will not be permitted except when moving picture machines of approved type are used. If driven by a motor, moving picture machine must be of a type expressly designed and approved for such operation, and when so approved by the Chief of the Fire Department, motor driven machines when in charge of a skilled operator may be permitted by the Chief of the Fire Department. This permission shall be given in writing or on a printed form used for this purpose and said permission shall be given in advance by the Chief of Fire Department and must state the name and type of machine and name of operator, and if no such permission is given, the machine must be operated by hand.

10. Reels containing films under examination or in process of rewinding must be enclosed in magazines or approved metal boxes similar to those required for films in operation, and not more than 2 feet of a film shall be exposed in booth.

11. Picture Machines must be placed in an Enclosure or House constructed in the following manner:

12. Construction of Enclosure or House (Booth).

(a) **Size of Booth.** All booths to be at least 6 feet 6 inches high, or high enough to provide space for gravity sliding doors, with floor space to vary according to the number of machines in booths, as follows:

One picture machine, 6 by 6 feet.

One picture machine and one stereopticon 9 by 6 feet.

Two picture machines and one stereopticon, 12 by 6 feet.

(b) Openings per machine in the booth, one for the operator and one for the machine. Opening for machine shall not be more than 8 inches high and 12 inches long. Operator's window shall be not more than 8 inches wide and more than 12 inches high. All openings in other portions of booth except ventilator in ceiling and entrance doors, must not exceed 8 inches wide and 12 inches high. All openings to this booth, excepting entrance doors to this enclosure or house, must be arranged so as to be entirely closed by doors or shutters constructed in the following manner: Doors must be hung so that gravity will tend to close them (only vertical sliding doors will be approved) and be held open by a twine arranged in such a way that it will pass directly over the film when in place. All doors over openings, except entrance doors, must be sliding doors, and be constructed of two pieces of No. 20 B. & S. gage galvanized iron, one piece placed on each side of $\frac{1}{4}$ inch asbestos; lap 1 inch around the corners, and the whole riveted together. The doors to lap over all edges of openings at least $1\frac{1}{2}$ inches. The same to run in galvanized iron guides of at least No. 14 B. & S. gage, the guides to lap over the door at least 1 inch, and fit snugly against the openings covered. The guides to be placed inside of the booth and all the heads of nails or screws holding same in place to be concealed by a single lock formed on the guides. These guides to be continued across bottom of opening to form a seat for the door to drop into. Corners of guides to be lapped and riveted.

Portable Booths. Permission may be granted by the Chief of Fire Department for the use of portable booths for temporary use in theatres, halls or churches, providing such booths be constructed of iron supports covered with either sheet metal, asbestos wood, asbestos cloth or some other approved non-combustible covering and no person shall operate any moving picture machine in which films are used in any theater, hall or church without first getting permission to do so from the Chief of Fire Department. The Chief of Fire Department must ascertain that the installation and use of said portable booth will not cause any unnecessary danger to life or property before granting permission as hereinbefore provided, and if, after permission is granted, said booth is not installed in a manner conforming with the provisions of this section, he shall have power to cancel said permit.

(c) Ventilation must be obtained through the roof by means of a chimney from all booths wherever possible and ventilation must be to the outside air and no ventilator to be of smaller size than 36 square inches in cross section per machine. This ventilator to be constructed with lock joints or rivets and solder not to be depended upon for holding sheets of metal in place. The gage of metal to be the same as used in the construction of iron booths.

(d) Entrance doors must close against an angle iron rabbet 1x1x3-16 inches, extending completely around openings, and be held closed by a metal rope and weight, the weight to run inside a protecting pipe, and the rope to pass over a pulley. This door must be constructed in a thoroughly substantial manner, and be braced so that the same will not warp or get out of shape. The doors shall be larger than 2x6 feet in size, and must be constructed of equally as good fire resisting material as the booth itself.

(e) Stationary wooden metal lined Booth to be constructed of sheathing at least ¾ inch thick, supported by presenting a smooth and solid surface on the inner side of booth. All studding, braces, etc. to be on the outside of booth. The ceiling and walls of booth must be lined with at least ⅛ inch asbestos under galvanized sheet iron as thick as No. 24 B. & S. gage, and the joints must be locked. The floor must be covered with galvanized sheet iron at least as thick as No. 20 B. & S. gage sheet iron over a ⅛ inch asbestos. Metal must be thoroughly secured in position by nails and the heads covered by approved lock joint, made with the metal lining of the booth. Entrance door openings must not be larger than 2x6 feet. All other openings must conform to Paragraph 12-b.

13. **Protective Features.** No waste water, newspaper, old clothes, rags, or in fact anything of an inflamable character will be permitted in the operating room. The walls and the floors of the operating room must be kept clean; under no circumstances must dust be allowed to accumulate. Waste will not be permitted in operating room. Such wiping rags as may be necessary must be kept in approved waste can. Under no circumstances must the operator leave the operating room without first having disconnected the current from the arc lamp of the machine. Smoking is positively prohibited. One chemical extinguisher, 2 buckets of water and 2 buckets of sand must be provided.

14. Any part or the whole of moving picture theatres or establishments shall be opened during hours of performance or at other reasonable hours for inspection thereof for the purposes of this code by the Chief of the Fire Department or by a member of the Fire Department detailed by the Chief thereof for that purpose.

15. Any person, firm partnership, company or corporation violating any of the provisions of this section shall be deemed guilty of a misdemeanor, and

upon conviction thereof before the Municipal Judge, shall be punished as prescribed in Section 200.

SECTION 184. **Requirements For Public Safety.** 1. In all buildings or parts of buildings occupied for purposes of assembly, other than theatres, which are provided for in Sections 180 to 184 inclusive, the halls, doors, stairways, passageways, and all other exit facilities shall conform to the provisions of this Code as provided for in Section 95, Means of Egress.

2. All seats shall be spaced as required for theatres. In computing the seating capacity of any room or building used for purposes of assembly in which the seats are not fixed, an allowance of six square feet of floor area shall be made for each person and all space between the walls or partitions of such room or building shall be measured in this computation. Movable seats are not permitted in balconies and galleries having stepped floors.

3. Any assembly hall containing a stage and seating more than 300 persons, if built within the fire restricted area, shall comply with the requirements for theatres, except that stages the area of which do not exceed one-fifth the area of the auditorium and having no transient scenery other than especially approved by the Building Inspector may conform to the following requirements:

The proscenium wall may be built as required for fireproof partitions. All allowed openings in the proscenium wall except the curtain opening shall be protected by approved fire doors. The curtain in such assembly halls may be of asbestos instead of the rigid theatre curtain and shall be hung on incombustible supports. All scenery, borders, and wings shall be rendered non-inflammable by being painted or saturated with some non-combustible material.

PART XXIII.

PLUMBING, DRAINAGE AND ELECTRICAL REQUIREMENTS

SECTION 185. **Plumbing And Drainage.** 1. The plumbing and drainage of all buildings, both public and private, shall be performed in accordance with the rules and specifications of the Department of Health and as specified in Ordinance No. 5946, City of Astoria.

SECTION 186. **Gas, Water And Steam Pipes.** 1. Every building, in which gas or steam is used for lighting or heating, shall have each supply pipe leading from the street mains provided with a heavy brass straightway stopcock or valve placed in the sidewalk at or near the curb, and arranged to permit shutting off at that point.

2. No gas, water, or other pipes shall be let into wooden beams unless placed within 36 inches of the end of the beams, and in no case shall the pipes be let into any beam more than one-fifth of its depth.

SECTION 187. **Installation Of Gas Pipes And Gas Appliances.** 1 All outlets and risers shall be left capped until covered by fixtures.

2. No unions or running threads shall be permitted. Where necessary to cut out for repair of leaks, or making extensions, pipe shall be again put together with right and left couplings.

3. All gas burners shall be placed at least 3 feet below any woodwork or ceiling attached to wooden beams, unless the same is properly protected by a shield, in which case the distance shall be not less than 18 inches.

4. No swinging or folding gas bracket shall be placed against or near any stud partition or woodwork.

5. No gas bracket on any lath and plaster partition or woodwork shall be less than 6 inches in length measured from the burner to the plaster surface or woodwork.

6. Gas lights placed near window curtains or any other combustible material shall be guarded by globes or wire cages.

7. Gas, gasoline, oil stoves and similar heating devices shall be placed on iron stands at least 6 inches above combustible supports, unless the burners are at least 5 inches above the base with metal guard plates 4 inches below the burners.

8. Gas connections to stoves and similar heating devices shall be made by rigid metal pipes. For small portable gas heating devices, flexible metal or rubber tubing may be used when there is no valve or other shut-off on the device.

9. No open flame heating or lighting device shall be used in any room where gasoline or other volatile inflammable fluids are stored or handled.

10. After all piping is installed and all outlets capped, there shall be applied by the plumber in the presence of an inspector of the Department of Buildings, a test with air to a pressure equal to a column of mercury 6 inches in height, and the same to stand for five

minutes; only mercury guage shall be used. No piping shall be covered, nor shall any fixture, gas heater or range be connected thereto until a card showing the approval of this test has been issued by the Building Inspector.

11. No meter shall be set by any gas company until a certificate is filed with them from the Building Inspector certifying that the gas pipes and fixtures comply with the foregoing rules.

SECTION 188. **Electrical Installations.** All electrical wiring, apparatus, or appliances for furnishing light, heat, or power, shall be in accordance with the current issue of the "National Electrical Code" and no installation of electrical equipment shall be made, except in conformity thereto.

PART XXIV.

REGULATIONS GOVERNING THE CONSTRUCTION AND OPERATION OF ELEVATORS

SECTION 189. **Construction And Operation Of Elevators.** 1. The term Elevator as used in this Code shall include all elevators, escalators, or lifts used for carrying passengers or freight. The term Dumbwaiter shall include such special form of elevator, the dimensions of which do not exceed 6 square feet in horizontal section, and 4 feet in height, and which is used for the conveyance of small packages and merchandise.

Any hand power elevator having a rise of more than 35 feet shall comply with all the requirements of this section. No belt elevators driven from a countershaft shall be installed for passenger service.

2. Before any elevator shall hereafter be installed or altered in any building, the owner shall submit, on appropriate blanks furnished therefor, to the Building Inspector an application in triplicate stating the construction and mode of operation of such elevator to be installed or altered, accompanied by such plans and drawings as may be necessary and shall obtain his approval therefor. Before any such elevator shall be put into service, the same shall have been duly tested and inspected by the Building Inspector and a certificate of inspection and approval obtained. In making any changes or alterations to elevator shafts, rails, overhead machinery or power, all the work changed or altered shall be made to conform to these regulations.

3. The owner of any elevator now in operation and the manufacturer of any such elevator hereafter placed

in any building, shall cause to be fastened in a conspicuous place in said elevator, a metal plate having suitable raised letters on same which shall designate the number of pounds which said elevator shall be permitted to carry, but in no case shall a carrying capacity of less than 100 pounds per square foot of platform area inside the car be permitted on any passenger elevator.

4. Every elevator, except full automatic push button elevators, shall be in charge of a competent, reliable, operator not less than eighteen years of age, who shall have had at least one week's experience in running an elevator under the constant supervision of a person who has received a certificate of competency as an elevator operator.

5. No person shall run any passenger or freight elevator in the city of Astoria unless he shall first register at the office of the Building Inspector, his name and residence, also the location of the building in which he is to perform such service, and shall first receive from the Building Inspector a certificate of competency.

6. Not more than one door opening in the elevator shaft shall be allowed on each floor, and all openings in the several stories shall be one above the other, except where the operating device of the elevator is so placed that the operator can readily control all doors without leaving the car control, in which case more than one door opening may be permitted on a floor.

7. All elevators hereafter installed in vertical shafts shall be controlled by some mechanical device that will automatically prevent the car being moved until the shaft door or gate at which the car is standing is shut and securely fastened, and which will prevent the opening of any shaft door or gate until the car has come to rest at the landing. All doors or gates opening into existing elevator shafts shall be locked or bolted in a manner to permit opening only by the operator of the car.

8. All counterweights shall have their sections strongly bolted together. There shall be not less than 3 feet clearance between the top of counterweights and the under side of overhead beams when the car is resting on the bumpers. No continuous forged straps shall be permitted on counterweights.

9. Elevator cars shall be constructed of incombustible materials, except that flooring may be of wood. There shall be not more than 1¼ inches space between the floor of the car and the floor saddles, and where the

saddles project into the shaft the same shall be properly beveled on the under side. The under side of the car shall be of incombustible materials. Cars for all elevators shall be properly lighted.

10. On passenger elevators all guide rails for both car and counterweights shall be of steel, and shall be bolted to the sides of the shaft with steel or cast-iron brackets, so spaced that the guide rails will be rigid. The splices in the rails shall be located as near such rigid supports as possible.

11. No passenger elevator shall be permitted to have a freight compartment attached to it in any manner.

12. Immediately under the sheaves at the top of every passenger elevator shaft in any building, there shall be provided a concrete slab or substantial grating of steel having not more than one inch space between the members of said grating, and of such construction as shall be approved by the Building Inspector.

13. A clear space of not less than 2 feet shall be provided between the bottom of the shaft and the lowest point of the under side of the car floor when the car is at its lowest landing; and between the top of the crosshead of the car and the under side of the overhead grating when the car is at its top landing; except that this latter space shall be not less than 5 feet for elevators having a speed in excess of 350 feet per minute, and may be reduced to 2 feet for elevators having a total rise not exceeding 30 feet, and a speed not exceeding 100 feet per minute.

14. All parts of the elevator machinery shall be inclosed by suitable partitions of incombustible materials, and such inclosures shall be lighted. Free and safe access shall be provided to all parts of elevator machinery. Where the machinery is located at the bottom of the shaft it shall be protected with a substantial pit pan.

15. At the top and bottom of all elevator shafts there shall be placed substantial buffer springs for car and counterweights.

16. The carrying beams and other supports for all machinery for passenger elevators shall be of steel designed for double the live loads to be supported.

17. Every passenger elevator shall have a trap door in the top of the car of such size as to afford easy egress for passengers, or where two cars are in the same shaft such means of egress may be provided in the side of each car.

18. The Building Inspector shall cause an inspection of elevators carrying passengers or employees to be made at least once in every three months, and shall require any necessary repairs to be made promptly by the owner. If the Building Inspector at any time considers an elevator to be unsafe, he may require its operation to cease until such repairs or alterations have been made as will in his judgment produce safety. In lieu of such inspection by his own Department, the Building Inspector may accept the report of inspections made by other reliable and properly constituted authorities which in his judgment are competent and satisfactory.

19. In every building exceeding 100 feet in height at least one passenger elevator shall be kept in readiness for immediate use by the fire department during all hours of the night and day, including holidays and Sundays.

20. It shall be unlawful to use any elevator that is not provided with safety devices for bringing the elevator car to rest without serious injury to passengers or operators whenever it may. for any reason exceed its rated speed by more than forty per cent or reach a speed of 850 feet per minute. Safety devices are not required upon the plunger type of elevators, nor upon sidewalk elevators which travel less than 30 feet.

21. The Building Inspector shall issue and enforce such other regulations regarding the construction, erection, operation or repair of elevators as he may consider necessary to insure safety. Such regulations being promulgated in accordance with the requirements of Section 196.

PART XXV.

SIGNS AND BILLBOARDS

SECTION 190. **Signs And Billboards.** 1. Wooden signs or bill boards may be permitted as follows:

(a) When not exceeding 13 feet in height above the curb level, with a clear space of not less than 3 feet between the bottom of the sign or billboard and the ground. Such signs or billboards shall be securely attached to posts or other supporting structure and shall be located entirely within the lot lines.

(b) When not exceeding 2 feet in height and fastened flat against the wall of a building, or in front of or on top of the cornice over a first story show window, or on top of a wall of a building.

(c) When not exceeding 2 feet in height but not exceeding 40 square feet in area and fastened flat against the wall of a building.

(d) All signs attached to a building shall be fastened directly to the walls by well secured metal anchors, nor shall such wooden signs have electric lights or fixtures attached to them in any manner.
Wooden supports or braces shall not be permitted.

2. All other signs or billboards within the fire limits shall be entirely constructed of incombustible materials, including all supports and braces for same.

3. Any letter, word, model, sign, device or representation in the nature of an advertisement, announcement or direction, supported or attached wholly or in part over or above any wall, building or structure, shall be deemed to be a sky-sign. Except as herein specified sky-signs shall be constructed entirely of metal, including the supports and braces for same, and no sky-sign shall project beyond the building line.

4. Within the fire limits no sky-sign shall be supported, anchored or braced to the wooden beams or other framework of a building which is over three stories high.

5. No sign attached to the side of a building or structure fronting upon a public thoroughfare, shall project beyond a point 18 inches back of the curb line, and no wooden sign shall project more than 2 feet outside the building line.

6. Sky-signs shall be set back at least 8 feet from the cornice or wall on a street front, shall not project more than 25 feet above the roof of a building, and shall have a space at least 6 feet in height between the bottom of the sign and the roof.

All such signs shall be designed to withstand a wind pressure of at least 30 pounds per square foot of surface.

7. No sign or billboard shall be so constructed as to obstruct any door, window or fire-escape, on any building.

8. Before the erection of any sign or billboard shall have been commenced, a permit for the erection of the same shall be obtained from the Building Inspector. Each application for the erection of any sign or billboard shall be accompanied by a written consent of the

owner or owners, or the lessee or lessees of the property on which it is to be erected.

9. This section shall apply to all signs hereafter erected whether placed upon new or existing buildings.

PART XXVI.

PROTECTION OF WORKMEN AND THE PUBLIC

SECTION 191. **Provision For Safety.** 1. Fireproof floor construction shall follow up the erection of the steel framing of all structures within two complete tiers.

2. If filling with brick or other fireproof material is not required between floor beams, the under flooring or other planking shall be laid in each story as the building progresses.

3. If the floor construction is of structural steel, the contractor for the steel work or the owner of building in course of erection shall thoroughly plank the entire tier of steel beams on which the structural steel work is being erected, except such spaces as may be reasonably required for hoisting materials and other erection work.

4. All openings in the floor framing intended for stairways, elevators or for other shafts shall be planked over or enclosed on all sides to a height of at least 3 feet.

5. If elevating or hoisting apparatus is used for the purpose of lifting materials within a building under construction, the shafts or openings in each floor shall be inclosed or fenced by a substantial barrier at least 6 feet high, except two sides for the handling of materials. These sides shall be guarded by an adjustable barrier not less than 3 feet high above the floor and not less than 2 feet from the edge of such shaft or opening.

SECTION 192. **Strength Of Temporary Supports.** Every temporary support placed under any structure, wall, girder or beam, during the erection, alteration, demolition, or repair of any building or structure or any part thereof, shall be of sufficient strength for safely carrying the load to be placed thereon.

SECTION 193. **Overloading To Be Avoided.** During the construction or alteration of any building or structure no material entering into such construction or alteration shall be placed on any floor in excess of the live load that such floor is intended to safely sustain.

SECTION 194. **Outside Scaffold.** Whenever outside scaffolds are used on buildings over 40 feet in height, whether they be suspended or constructed of poles and thrustouts, they shall be provided with a substantial guard railing or enclosure or wire mesh or other suitable material, extending 4 feet above the working platform on its outer edge and ends. All such scaffolds shall be constructed in a manner to secure the safety of the workmen on them and the people using the street, and so as to conform to the laws of the state of Oregon.

SECTION 195. **Shed For Protection Of Pedestrians.** When buildings or any part thereof are erected or increased in height to over 40 feet upon or along any street, the person erecting or altering such building shall erect and maintain an approved substantial shed from the area line to the curb for the full frontage of the building. No shed shall be required when a building is erected 10 feet or more back of the building line. The street side shall be kept open for a height of not less than 5 feet above the curb, and the shed shall be kept properly lighted at night.

PART XXVII.

ADMINISTRATION OF DEPARTMENT OF BUILDINGS

SECTION 196. **General Powers And Duties Of The Building Inspector.** 1. The Building Inspector shall be a competent architect, engineer, or builder of at least 10 years' practical experience. He shall have the power, and it shall be his duty to enforce the provisions of this Code; to approve or disapprove within a reasonable time, applications, plans, detail drawings, and amendments thereto; to issue permits, notices, and certificates; to make rules and specifications to assist in the proper application of this Code, or providing for necessary additional regulations covering details of special construction; to pass upon questions relative to the mode, manner of construction, or materials used in the erection or alteration of a building, and to require that such mode, manner of construction, or materials, shall conform to the true intent and meaning of the several provisions of this Code.

2. The Building Inspector shall have power to vary or modify any provisions of this Code or of any existing law or ordinance relating to the construction, alteration or removal of any building, or structure erected or to be erected within his jurisdiction upon an application to him therefor in writing by the owner of

such buildings or structure, or his duly authorized agent, where there are practical difficulties in the way of executing the strict letter of the law, so that the spirit of law shall be observed and public safety secured and substantial justice done. Where such application has been filed with the Building Inspector the owner of such building or structure or his duly authorized agent shall have the right to present a petition to the Building Inspector, setting forth the grounds for the desired variation or modification, and requesting that he may appear before him and be heard. The Building Inspector, shall fix a date within a reasonable time for a hearing upon such application, and shall as soon as practicable render a decision thereon, which decision shall be final, except for appeal to the Board of Appeals as provided in Section 197. The particulars of each application and of the decision thereon shall be entered upon the records of the Building Inspector, and if the application is granted a certificate thereof, together with a statement of the reasons for such decision, shall be issued by the Building Inspector. A record of all such modifications shall be kept at the office of the Building Inspector, properly indexed under Section numbers of this Code, and shall be open to public inspection.

Any necessary modifications of this Code which may be made by the Building Inspector under the provisions of this paragraph, or such rules and specifications as he may draft in accordance with the authority granted in paragraph 1, shall in no manner serve to essentially lower the standards of construction which this Code prescribes.

3. The Building Inspector shall establish specifications for all tests, also specifications for the quality of materials and appliances or methods of construction not otherwise covered by this Code; such specifications shall give the details for the conduct of such tests and the necessary requirements to secure approval of same. They shall be filed in the office of the Building Inspector. A public record of all approved material and construction shall be kept in the office of the Building Inspector. Such records shall state by whom the approval is granted, and give a clear statement of the evidence upon which its fitness for approval was based.

4. During the month of January of each year, the Building Inspector shall prepare a complete list of all materials, appliances or methods of construction which have passed the required tests prescribed by this Code, or have been approved by other rules of Department,

and the necessary information as to the conditions under which said materials, appliances or methods of construction were tested and approved. Said list shall be filed in the office of the Building Inspector not later than the first week in February.

5. No new materials, appliances, or methods of construction shall be employed in any building until they have met the test requirements of the Building Inspector and been approved by him.

6. The Building Inspector shall, subject to the provisions of the City Charter, have the power to appoint one or more deputy building inspectors and such other inspectors or subordinates as may be necessary to enforce the rules of the Department and the provisions of this Code. It shall not be lawful for any officer or employee in the Department of Buildings to be engaged in business as an architect, engineer, carpenter, plumber, iron worker, mason or builder, while holding office in the Department, or to be engaged in the manufacture or sale of articles entering into the construction of buildings, or act as agent for sale of such articles.

7. The Department of Buildings shall have a seal, to be approved by the Mayor, and the use of such seal shall be as directed by the Building Inspector.

8. The Building Inspector shall prescribe uniform badges to be worn by him, his inspectors and other employees of the Department of Buildings, and so far as it may be necessary for the performance of their respective duties, shall have the right to enter any building or premises in the City of Astoria upon exhibiting their badges.

9. Neither the Building Inspector nor any person appointed, hired or employed by him, when acting in good faith, and without malice, shall be liable for damages by reason of anything done under the provisions of this Code.

SECTION 197. **Appeals.** 1. Whenever the Building Inspector shall reject or refuse to approve the mode or manner of construction proposed to be followed, or materials to be used in the erection or alteration of any building or structure, or when it is claimed that the rules and provisions of this Code do not apply, or that an equally good or more desirable form of construction can be employed in any specific case, the owner of such building or structure, or his duly authorized agent, may appeal from the decision of the Building Inspector where the amount involved by such decision shall exceed the sum of one thousand dollars. At the time of filing an appeal, a fee of twenty dollars shall be paid to the City of Astoria by the person filing such appeal.

2. Such appeal shall be heard by a Board of Appeals consisting of the Chief of the Fire Department and four other members appointed annually by the City Manager, two of whom shall be practicing architects of at least ten years' practice and two builders of at least ten years' experience. The said members shall each take the usual oath of office before entering upon the performance of their duties.

The City Manager shall annually designate one of said members as the presiding officer of said board. At least four affirmative votes shall be necessary to the granting of any petition by said board. No member of said Board of Appeals shall pass upon any question in which he is personally interested. The said Board shall meet upon notice of the Building Inspector. Each member of said Board of Appeals, except the Chief of Fire Department, shall be entitled to and shall receive five dollars for each appeal attended by such member, to be paid by the City Treasurer upon the voucher of the clerk of said Board. The clerk of the Board shall be appointed, and may be removed by the City Manager, and shall receive no compensation for such services.

The appeal authorized by this section may be taken within 10 days from the entry of a decision upon the record of the Building Inspector, by filing with the clerk of the Board of Appeals an application on appropriate blanks furnished by the Board of Appeals, containing the decision of the Building Inspector, the date of entry, the grounds upon which said appeal is taken, and the arguments in support of the request of a reversal of the decision of the Building Inspector by the Board of Appeals.

The Board of Appeals shall thereafter fix a day within a reasonable time for the hearing of such appeal, and upon such hearing the appellant may be represented either in person or by his agent or attorney. The decision of the Board of Appeals, upon such appeal, shall be rendered without unnecessary delay, and such decision shall be final.

PART XXVIII.

VIOLATIONS, PENALTIES, AND COURTS HAVING JURISDICTION

SECTION 198. **Removal Of Violations.** Whenever the Building Inspector has evidence that there exists in any building or structure erected or in the course of erection or alteration a violation of any provision of this Code, or of any of the regulations of the Department of Buildings governing the installation or repair of any plumbing, drainage or electrical work, he may in his discretion, request the Common Council to authorize the City Attorney to institute any appropriate action or proceeding at law or in equity, to restrain, correct, or remove such violation; prevent further work upon the building or structure; require its removal; or prevent the occupancy or use of the building or structure.

SECTION 199. **Notice Of Violation And Service Thereof.** Notices of violations of any provision of this Code shall be issued by the Building Inspector and shall have his name affixed thereto. A notice of violation shall be served upon the person charged with the violation or upon the person designated in Section 203, or by any person authorized by said Building Inspector. Such notice shall contain a brief statement of the nature of the violation charged and the penalty or penalties that may be incurred, a brief description of the building or structure and premises to which the notice refers, including its location and a direction to the owner requiring that the violation be removed forthwith. A copy of Section 204 entitled "Duty of Occupant to Notify Owner," shall be printed thereon. If the person charged with the violation, or the person designated in Section 203 cannot be found in the City of Astoria after diligent search, then service may be made, affixing the same in a conspicuous place on the property as to which a violation is alleged to exist, or to which such notice may refer, and by depositing in a post office in the City of Astoria a copy thereof in a securely closed postpaid wrapper, addressed to him at his last known place of residence, or his last known place of business. If his place of residence or business is not known, and the Building Inspector cannot with reasonable diligence acertain either, or a place where he would probably receive the matter transmitted through the post office, he may dispense with deposit of any papers, and upon an affidavit thereof the notice of violation shall be deemed served, and the same action or proceeding may be taken thereupon as if he had been personally served.

SECTION 200. **Punishment For Violation Of Provision Of Code.** 1. Violation a Misdemeanor. Any person who shall construct, alter, remove or maintain a building or structure or any of its appurtenances in violation of any provisions of this Code shall be guilty of a misdemeanor, punishable by a fine of not more than two hundred and fifty dollars or by imprisonment not exceeding 60 days or both, such fine and imprisonment. If such violation shall be removed or in process of removal within 10 days after the service of a notice of violation and shall be actually removed within a reasonable time, the liability for all or a portion of such penalty may cease, in the discretion of the court. Whenever it shall be necessary in the opinion of the Building Inspector in order to carry out or enforce any of the provisions of this Code, he may and shall have authority to call on the Police Department when called upon by the Building Inspector, to co-operate with the said Building Inspector in order to enforce or put into effect any of the provisions of this Code.

PART XXIX.

PROCEEDINGS IN CONNECTION WITH UNSAFE OR COLLAPSED BUILDINGS

SECTION 201. **Unsafe Buildings.** 1. Notice to Make Safe. When it is reported to the Building Inspector that any building or structure or part thereof is unsafe or dangerous, he shall immediately cause an examination of the property to be made. If this examination shows the building or structure or any portion thereof to be unsafe or dangerous, as to the construction, the occupancy or exits, the result thereof shall be entered upon a docket and the Building Inspector shall at once serve notice, in the manner prescribed in Section 199 upon the owner or upon the person designated in Section 203. Such notice shall have printed upon it a copy of Section 204 and shall contain a description of the building or structure considered unsafe or dangerous, and shall require the same to be made safe and secure or removed, as may be considered necessary by the Building Inspector; and it shall require the person served therewith to immediately certify in writing to the Building Inspector his consent or refusal to secure, make safe or remove the building or structure or part thereof. If he immediately certifies in writing his consent to comply therewith he shall be allowed 24 hours following the service of such notice in which to begin to secure, make safe or remove the building or structure. He shall employ sufficient labor and materials, and immediately begin to secure, make safe or remove the same. The work shall be done as speedily as possible, and shall be continuously prosecuted to the satisfaction of the Building Inspector.

2. Notice of Survey. Should the person so served with notice neglect or refuse to comply with any of the requirements of said notice to the satisfaction of the Building Inspector, a further notice, which shall have printed upon it a copy of Section 204 shall thereupon be served upon him in the manner heretofore prescribed. Said notice shall state that a survey of the premises specified therein will be made by a Committee of Surveyors, to be appointed as prescribed in Section 205 at a stated time and place, which time shall be not less than 24 hours nor more than 3 days from the time of service of said notice. But if the owner proceeds to secure, make safe or remove the unsafe or dangerous building or structure, or part thereof, and prosecutes the work in a manner satisfactory to the Building Inspector, the survey may be adjourned or cancelled at his discretion.

3. Survey. Should the Building Inspector consider it necessary, a survey shall be held. The Committee of Surveyors shall attend at the time and place specified, examine the building or structure, and immediately report in writing its opinion thereof to the Building Inspector. Should two members of the committee report the building or structure unsafe or dangerous, a copy of their report, with a copy of the notice of survey, shall forthwith be posted in a conspicuous place upon the building or structure. A copy of their report shall also be immediately presented by the Building Inspector to the City Attorney, who shall forthwith apply to the court for a Precept directed to the Building Inspector, commanding him to remove the building or structure or part thereof, or make the same safe and secure.

A cause of action is hereby created for the benefit of the City of Astoria against the owner of said building or structure and of the land upon which it is situated, for the amount of the fees, with interest, to the Committee of Surveyors, which action shall be prosecuted by the City Attorney in the name of the City of Astoria.

4. Court Proceeding. In any proceeding to remove an unsafe or dangerous building or structure or to make the same safe and secure the written report of survey shall constitute the issue of fact. The said issue shall be brought to trial before a justice of the court, who shall give this issue precedence over every other business, and his decision shall be final. If the decision of the court be that the building or structure or part thereof is unsafe or dangerous, the justice shall immediately issue a Precept commanding the Building In-

spector to secure, make safe or remove the unsafe or dangerous building or structure or such part thereof as shall be specified, permitting him in his discretion to authorize the owner to do so, as hereinafter specified. and empowering him to modify the requirements of said Precept when he shall be satisfied that such modification will secure equally well the safety of the building or structure.

5. Execution of Precept. The Building Inspector shall thereupon proceed to execute the Precept as therein directed. He may procure the necessary materials, ways, works and means, and employ such experts, employees, mechanics, workmen, and laborers as may be necessary for that purpose; or may, in discretion, upon payment by owner of the unsafe or dangerous building or structure of all costs and expenses theretofore incurred in the proceedings, issue to him an authorization to carry out the requirements of the Precept, and this work shall be immediately done to the satisfaction of the Building Inspector. If thereafter in his judgment it shall be necessary, the Building Inspector shall himself enter and execute said Precept, as heretofore prescribed.

After completion of the work the Building Inspector shall cause the return to the said court of said Precept with an endorsement thereon of his action thereunder, and a statement of the costs and expenses thereby incurred, including preliminary searches and surveys.

6. Costs: Disbursements: Expenses: The justice shall thereupon tax, award, adjust and allow such costs, disbursements and expenses as may have been incurred and render judgment therefor, and direct that the same be paid by the owner of the property designated in the action, and may declare the same a lien upon said property and direct that it be sold as on a judgment in foreclosure of a mortgage upon real estate or a mechanic's lien upon real property. The subsequent proceedings shall be in the same manner and with like effect as under judgments in said forms of action; and in and about all preliminary proceedings, as well as the carrying into effect of any orders of the court or any Precept issued by any court, said Building Inspector may make requisition upon the Treasurer of the City of Astoria for such amount or amounts of money as shall be necessary to meet the expenses thereof; and upon the same being approved by any judge or justice of the court from which the said order of Precept was issued and presented to said Treasurer, he shall pay the several amounts that may from time to time be required,

which shall be reimbursed by the payment of the amount and interest at 6 per cent out of the judgment obtained as aforesaid, if the same shall be collected.

7. Emergency Work. If in the opinion of the Building Inspector there shall be actual and immediate danger of the falling of any building or structure or part thereof so as to endanger life, limb or property, or there shall be any illegal or defective work, or work in violation of or not in compliance with any of the provisions or requirements of this Code, he or such person as he may authorize, shall order all further work to be stopped in and about said building or structure, and require all persons to vacate the same. He shall cause such work to be done as in his judgment may be necessary to remove the danger, and he may, when necessary for public safety, temporarily close the sidewalks and streets adjacent to such building or structure. The Police Department of the City of Astoria, when called upon by the Building Inspector, shall enforce such orders and requirements.

8. Recovery Of Bodies. In case a building or structure or part thereof falls and persons are known or believed to be buried in the ruins, it shall be the duty of the Building Inspector to cause search of the premises to be made for rescue of the living and the recovery of the bodies of the dead. For such purposes he may temporarily hire persons, and temporarily hire or purchase the materials, ways, works and means which may be necessary. Whenever, in making such search, it shall be necessary to remove debris from the premises, it shall be the duty of the various departments of the City of Astoria, when called upon by the Building Inspector, to co-operate, and to provide a suitable and convenient place for the deposit of such debris. The Building Inspector is hereby authorized and empowered in such cases to order and require the occupants of such building or structure or part thereof, to vacate the same forthwith, and he may, when necessary for the public safety, close the sidewalk and streets adjacent to such buildings or structures, or part thereof, and prohibit the use of the same; and the Police Department of the City of Astoria, when called upon by the Building Inspector, shall enforce such orders or requirements.

PART XXX.

LEGAL PROCEEDINGS, REPRESENTATIVE OF OWNER, COMMITTEE OF SURVEYORS

SECTION 202. **Legal Proceedings.** 1. Duty of

City Attorney to Proceed. Upon written request by the Building Inspector the City Attorney shall sue for and collect all penalties and take charge of and conduct all legal proceedings imposed or provided for by this Code; and all suits or proceedings imposed or provided for by this Code; and all suits or proceedings instituted for the enforcement of any of the several provisions of this Code or for the recovery of any penalty thereunder, shall be brought in the name of the City of Astoria by the City Attorney, to whom all notices of violation shall be returned for prosecution, and it shall be his duty to take charge of the prosecution of all such suits or proceedings, collect and receive all moneys that may be collected upon judgments, suits or proceedings so instituted, or which may be paid by any parties who have violated any of the provisions of this Code and upon settlement of judgment and removal of violations thereunder, execute satisfaction therefor.

2. Temporary Injunctions. In any action or proceeding for the enforcement of the provisions of this Code the City of Astoria may apply to the Court for an order enjoining and restraining any violation, ordering the property vacated or prohibiting its use for any purpose whatsoever, until the hearing and determination of such action and the entry of final judgment therein.

3. Undertaking Not Required. No undertaking shall be required from the City of Astoria or the Building Inspector as a condition to granting an injunction or order, or by reason thereof, in any action or proceeding.

4. Notice of Lis Pendens; Filing by Counsel. Upon the commencement of an action or proceeding to enforce the provisions of this Code the City Attorney shall file in the County Clerk's office of the County where the property is situated, a notice of lis pendens, stating the names of the persons claimed to be affected thereby, with a copy of the notice of violation or notice of survey, and proof of service thereof, and a copy of the action or proceeding instituted or to be instituted. The City Attorney may, however, in his discretion, file such notice at any time.

5. Effect of Notice of Lis Pendens. A notice filed, as prescribed in the preceding paragraph, is constructive notice to an owner or encumbrancer of the property affected thereby, and to an owner or encumbrancer therof, from or against a person with respect to whom the notice is to be filed and indexed, as prescribed in the next paragraph. A person whose conveyance or

encumbrance is subsequently executed or subsequently recorded, is bound by all proceedings taken in the action, after filing of the notice, to the same extent as if he were a party to the action.

6. Notice of Lis Pendens to be Filed and Indexed. Each County Clerk with whom such notices are filed, shall immediately file and index it to the name of the person specified in a direction appended at the foot of the notice of lis pendens and subscribed by the City Attorney, and to the property affected, and under the section number of the land map of the county where the property is situated.

7. Cancellation of Notice of Lis Pendens. After an action is commenced, and is settled, discontinued, abated or final judgment is rendered therein, against the City of Astoria, and the time to appeal therefrom has expired, or if the City Attorney unreasonably neglects to proceed with the action, the Court may, in its discretion, upon the application of any person aggrieved, and upon such notice as may be directed or approved by it, direct that the notice of lis pendens, filed as prescribed in the last paragraph, be cancelled of record by the County Clerk with whom it is filed. The cancellation shall be made by a note to that effect in the index to the names of each person and the property specified in the notice filed, referring to the order or consent of counsel in this section provided, and a like note upon the notice filed. Unless the order is entered in the same clerk's office, a certified copy thereof shall be filed therein before the notice is cancelled.

8. Before or after an action is commenced to enforce a notice of violation, the notice or pendency thereof shall be likewise cancelled upon the written consent of the City Attorney, which consent shall be filed with and indexed by said County Clerk.

9. No officer of the Department of Buildings, acting in good faith and without malice, shall be liable for damages by reason of anything done in any such action or proceedings.

SECTION 203. **Designation By An Owner Of A Building.** Either a resident or non-resident of the City of Astoria, of full age, owning real estate or a building thereon, may execute and acknowledge in duplicate, a written power of attorney of a resident of said City, as a person upon whom to serve a notice of violation, notice to make safe, or notice of survey, a summons, a mandate, or any paper or process, under the provision of this Code, or either of the same, and may file the same, with the written consent of the person so designated, duly acknowledged; one in the office of the Building Inspector, and one in the office of the County Clerk where the real estate or buildings or structure is situated. The power of Attorney must specify the residence and place of business of the person making it, and also of the person designated, and the location of the property with respect to which the power of attorney is made. It shall remain in force during the period specified therein, if any, or if no period is specified therein, until one year after the filing thereof, but it is revoked earlier, either by the death or legal incompetency of either parties, or by the filing of a revocation by either of parties, duly acknowledged and the consent of the Building Inspector. While the power of attorney remains in force, as prescribed in this Section, a notice of violation, notice to make safe or notice of survey, summons, a mandate, or any paper or process under the provisions of this Code, or either of the same, may be served upon the person so designated, in like manner and with like effect, as if it were served personally upon the person making the power of attorney, notwithstanding his presence in the City of Astoria.

SECTION 204. **Duty Of Occupant To Notify Owner.** Should a notice of violation, a notice to make safe, or a notice of survey be served upon an occupant of real estate or a building or structure, it shall be the duty of the person upon whom such service is made, to give immediate notice thereof to the owner of said real estate or building or structure named in the notice, if such owner is within the City of Astoria and his residence is known to such person; and if he is not within the said city, by depositing such notice in a post office in the City of Astoria, properly enclosed in a postpaid wrapper addressed to such owner at his then known place of residence.

SECTION 205. **Committee Of Surveyors.** 1. A committee of surveyors shall consist of three persons, one of whom shall be Building Inspector, an engineer, or an Inspector of the Bureau of Buildings designated in writing by said Building Inspector; another of whom shall be an architect, civil engineer or builder of at least ten years' practice in the City of Astoria, appointed by the Mayor of said City; another of whom shall be a practicing architect, engineer, or builder, of at least ten years' practice, appointed by the owner of said building or structure. In case the owner fails to appoint or having appointed, the said representative fails to attend according to notice, the two surveyors first named shall make the survey, and if they do not agree, they shall appoint another member, who shall be a practicing architect, engineer or builder of at least ten years' practice.

2. The architect, civil engineer, or builder appointed by the Mayor of the City of Astoria who may serve on a committee of surveyors, as prescribed in Section 201, shall receive the sum of twenty-five dollars for each survey thereof, to be paid by the City Treasurer upon the voucher of the Building Inspector. Should the owner fail to appoint another member as prescribed in this section, the members so appointed shall receive the sum of twenty-five dollars for each survey payable as above.

PART XXXI.

GENERAL PROVISIONS

SECTION 206. **Existing Suits And Liabilities.** Nothing in this Code contained, shall be construed to affect any suit or proceeding now pending in any court, or any rights acquired, or liability incurred, nor any cause or causes of action accrued or existing, under any act or ordinance repealed hereby. Nor shall any right or remedy of any character be lost, impaired or affected by this Code.

SECTION 207. **Invalidity Of One Section Not To Invalidate Any Other.** The invalidity of any section or provision of this Code shall not invalidate any other section or provision thereof.

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